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OFFICIAL GAZETTE

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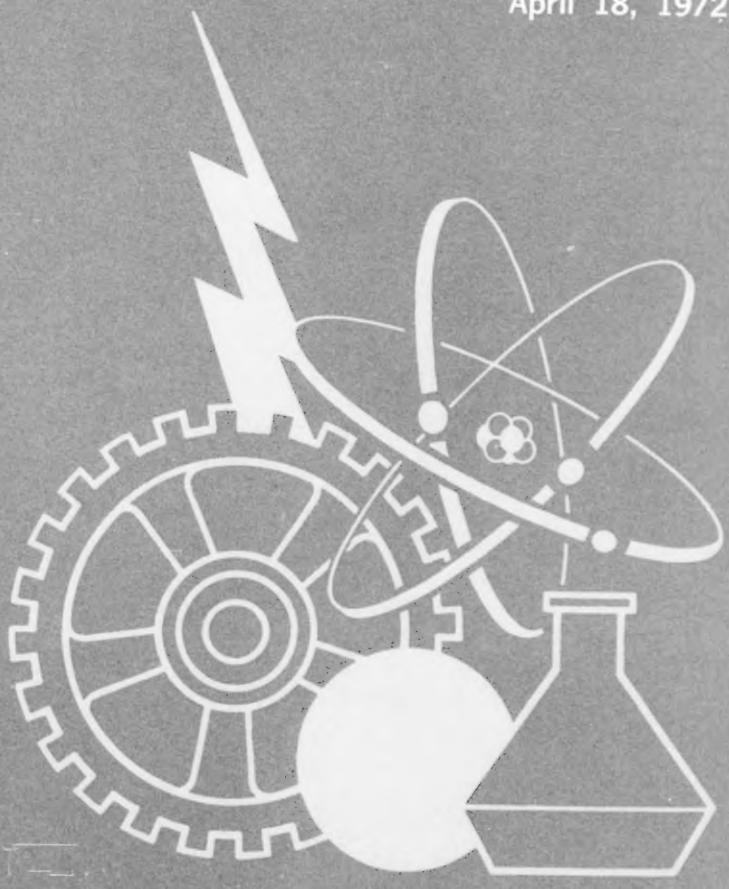
PATENTS

April 18, 1972



U. S. DEPARTMENT OF COMMERCE
Patent Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

April 18, 1972 Volume 897 Number 3

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PATENT OFFICE NOTICES

Nice Agreement

The Department of State has deposited the instrument of accession to the Nice Agreement Concerning the International Classification of Goods and Services for the Purpose of the Registration of Marks of June 15, 1957, as Revised at Stockholm on July 14, 1967, with the Director General of the World Intellectual Property Organization. The Nice Agreement enters into force as of May 25, 1972.

ROBERT GOTTSCHALK,
Approved: Mar. 16, 1972. *Commissioner of Patents.*

Locarno Agreement

The Department of State has deposited the instrument of ratification of the Locarno Agreement Establishing the International Classification for Industrial Designs of October 8, 1968, with the Director General of the World Intellectual Property Organization. The Locarno Agreement enters into force, for the United States, as of May 25, 1972.

ROBERT GOTTSCHALK,
Approved: Mar. 16, 1972. *Commissioner of Patents.*

ABBREVIATED FIRST ACTION PROGRAM

The Abbreviated First Action Program using Form PO–1142 announced in the OFFICIAL GAZETTE of February 2, 1971 (883 O.G. 2) has been reviewed in the light of comments received from examiners, attorneys, and other members of the public, pursuant to the notice of November 10, 1971 (893 O.G. 1). As a result of this review the program will be continued and the form modified to incorporate some of the suggested improvements. The space for the explanation of the rejection will be expanded. In addition, the instructions to the examiners will be supplemented to reinforce the original stress on the importance of legibility, clarity and completeness in setting forth the examiner's position, and desirability of including suggestions that would render the case allowable.

RICHARD A. WAHL,
Mar. 17, 1972. *Assistant Commissioner.*

EXAMINER TESTIMONY

As stated in Section 1701 of the Manual of Patent Examining Procedure, patent examiners are forbidden to testify as patent experts or to express opinions, in testimony or otherwise, as to the invalidity of any issued patent. Patent examiners have, in connection with litigation involving patent validity, been called to testify on factual matters. In those cases, the practice has been to permit the examiner to testify only upon the issuance of a subpoena.

Henceforth, patent examiners will be permitted to testify on deposition in patent suits, without the need for a subpoena, provided the following conditions are satisfied:

1. The party proposing to take the testimony will state in writing, that the questions to be asked of the examiner will be phrased to comply with the permissible scope of inquiry as outlined in the protective orders contained in the Court opinions in *In re Mayewsky*, 162 USPQ 86, 89 and *Shaffer Tool Works* v. *Joy Manufacturing Co.*, 167 USPQ 170, 171: " . . . the scope of the oral depositions of the patent examiners is hereby limited to matters of fact and must not go into hypothetical or speculative areas or the bases, reasons, mental processes, analyses, or conclusions of the patent examiners in acting upon the patent applications maturing into the patent [in suit]." 167 USPQ 171.
2. That in addition to complying with the requirements of Rule 30 of the Federal Rules of Civil Procedure, the party taking the testimony will agree to give notice of the taking of the deposition of the patent examiner to the Solicitor, at least thirty days prior to the date on which the taking of the deposition is desired.
3. That the party taking the deposition arrange with the Solicitor to notice the deposition at a place convenient to the Patent Office.

If the party desiring to take the testimony of the examiner does not agree to the conditions enumerated, the Patent Office will not permit the examiner to be deposed without a subpoena and compliance with the precedure set forth in Section 7.02, Department of Commerce Administrative Order 205–12, June 29, 1967 as amended April 10, 1970. That section states:

> In any case where it is sought by subpoena, order or other compulsory process or other demand of a court or other authority (hereinafter referred to as a "demand") to require the production or disclosure of any record in the files of the Department of Commerce or other information acquired by an officer or employee of the Department as a part of the performance of his official duties or because of his official status, the matter shall be immediately referred for determination to the appropriate official described in subsection 4.01 of this order. If such official has discretion with respect to disclosure and he determines that it would be improper to comply with the demand, or if he has no discretion with respect to disclosure, the matter shall be promptly referred to the Secretary of Commerce for final determination. Unless and until the Secretary determines that the records or information should be produced, the officer or employee who appears in answer to the demand shall inform the court or other authority (*a*) that the section 7 of this order prohibits the officer or employee from producing or disclosing the records or other information demanded without the prior approval of the Secretary of Commerce, and (*b*) that the demand has been, or is being, as the case may be, referred for the prompt consideration of the Secretary. The officer or employee shall also provide the court or other authority with a copy of the regulations prescribed in this section 7 of this order, and shall respectfully request the court or other authority to stay the demand pending the receipt of instructions or directions from the Secretary of Commerce concerning the demand.

ROBERT GOTTSCHALK,
Mar. 13, 1972. *Commissioner of Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,729,067, R. Patterson, METHOD FOR FORMING PILES, **filed** Nov. 8, 1971, D.C., M.D. Fla. (Tampa), Doc. 71–497–C, *Intrusion Prepakt Incorporated* v. *Consolidated Soils, Inc.*

2,843,935, H. J. Gerber, INSTRUMENT FOR MEASURING, INTERPOLATING, PLOTTING AND THE LIKE, **filed** Jan. 28, 1971, D.C. Mass. (Boston), Doc. 71–258–J, *The Gerber Scientific Instrument Co.* v. *Charles J. Colligan and Data Scales, Inc.* Stipulation of dismissal filed Dec. 21, 1971.

2,919,506, P. V. Larsen, EXCAVATING TOOTH AND BASE SUPPORT THEREFOR, **filed** Sept. 7, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2147–CC, *Esco Corporation* v. *Industrial Parts Depot, Inc.*

2,951,761, J. T. Stephan, FISH BAIT, **filed** July 31, 1968, D.C., S.D. Idaho (Boise), Doc. 1–69–60, *Puget Sound Salmon Egg Company, Inc.* v. *Shoshoni, Inc. et al.* Consent judgment restraining defendants from making or selling fish eggs covered by this patent, Oct. 22, 1971.

2,970,783, D. A. Cheyette, COMPOSITE WEARING PARTS FOR CRUSHERS AND THE LIKE, **filed** Dec. 28, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–3050–IH, *Rex Chainbelt Inc.* v. *DFC Company, Inc.*

2,973,643, Roderick and Gwathmey, AIRCRAFT RATE OF CLIMB INDICATING INSTRUMENTS, **filed** Nov. 4, 1971, D.C. Kans. (Wichita), Doc. W–4728, *Teledyne, Inc.* v. *Aerosonics Corporation.*

3,012,303, Whitaker, Whitaker and Whiting, PRODUCTION OF MULTICOLORED PILE FABRIC, **filed** Apr. 10, 1970, D.C., W.D. Va. (Lynchburg), Doc. 70–C–15–L, *Fred Whitaker Company* v. *Burlington Industries, Inc.* Order, case settled by agreement. Plaintiff owner of patent, injunction issued restraining defendant, Nov. 16, 1971.

3,425,435, R. Garabello, ROTARY OSCILLATING PISTON PUMP ADDITIVE INJECTION DEVICE FOR FLUID DELIVERY SYSTEM, **filed** July 6, 1971, D.C.N.J. (Newark), Doc. C–992–71, *Metropolitan Petroleum Petrochemicals Co., Inc.* v. *Aetna Chemical Corporation.* Stipulation and order dismissing action, filed Nov. 4, 1971.

3,425,626, Dietz & Dietz, DRINKING STRAW, **filed** Feb. 24, 1969, D.C., E.D.N.Y. (Brooklyn), Doc. 69C197, *John F. Dietz et al.* v. *Newman Premier Corp.* Order of dismissal, Nov. 8, 1971.

3,460,162, P. H. Sijbring, METHOD FOR PEELING POTATOES OR SIMILAR TUBERS, BULBS, ROOTS, OR FRUITS AND AN APPARATUS FOR CARRYING OUT THIS METHOD, **filed** Oct. 19, 1971, D.C., N.D. Calif. (San Francisco), Doc. 71–2004, *Instituut Voor Bewaring en Verwerking Van Landbouwprodukten* v. *Magnuson Engineers, Inc.*

3,473,509, M. Miyamura, METHOD FOR THE ARTIFICIAL CULTURE OF SHRIMP, **filed** Jan. 5, 1972, D.C. Del. (Wilmington), Doc. 4305, *United States of America* v. *Marifarms, Inc. and Mitsutake Miyamura.*

3,475,070, T. C. Hoshall, DISPLAY CASE, **filed** Oct. 23, 1970, D.C., W.D. Okla. (Oklahoma City), Doc. 70–526–C, *Thomas C. Hoshall and Rainbo Photo Color, Inc.* v. *Mid-Continent News Company.* Plaintiff Hoshall has title to U.S. Letters Patent No. 3,475,070; Rainbo Photo Color, Inc., is exclusive licensee to manufacture, sell, etc. display cases constructed in accordance with said patent. Defendant Permanently restrained and enjoined from further infringement thereof, but plaintiffs agree that defendant has right to continue using display cases owned by defendant on July 23, 1971 and which were found to infringe patent, Sept. 30, 1971.

3,489,498, Brody and Chaney, FLAME PHOTOMETRIC DETECTOR WITH IMPROVED SPECIFICITY TO SULFUR AND PHOSPHORUS, **filed** Oct. 29, 1971, D.C., S.D. W. Va. (Charleston), Doc. 71 222–CH, *American Standard Inc. and Meloy Laboratories* v. *The Bendix Corporation.*

3,494,056, B. J. Elzer, DISPLAY DEVICE, **filed** Dec. 23, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c3216, *Grafika Commercial Arts, Inc.* v. *Parisian Novelty Co., Inc. and Joseph Mfg. Co.* Cause dismissed without prejudice, May 17, 1971.

3,568,853, H. J. Feibelman, ARTICLE HOLDER FOR USE IN DISPLAY RACK, **filed** Nov. 10, 1971, D.C., E.D.N.Y. (Brooklyn), Doc. 71C1456, *A. & H. Mfg. Co.* v. *Novel Box Co., Inc.*

3,589,680, C. J. Kuhn, HYDRAULIC PULLEY APPARATUS, **filed** Nov. 18, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–2772–CC, *Applied Power Industries, Inc.* v. *Milton Wichner et al.*

3,598,088, Bowman, Bowman and Moeller, LIVESTOCK DIP APPARATUS, **filed** Sept. 27, 1971, D.C., W.D. Okla. (Oklahoma City), Doc. 71–621–C, *Jim H. Bowman et al.* v. *Lloyd Lanier et al.* Defendants enjoined; jurisdiction of cause retained by court for purpose of such further orders as may become necessary, Oct. 15, 1971.

3,599,844, B. H. Dickson, STRAW AND CHAFF SAVER OR BUNCHER, **filed** Dec. 21, 1971, D.C. Colo. (Denver), Doc. C–3606, *Benjamin H. Dickson and Benjamin H. Dickson, Jr.* v. *A. L. Chandler, doing business as Hi-Way Implement Co. et al.*

3,605,583, J. E. Keppler, VIBRATORY ROLLER COMPACTING APPARATUS AND METHOD, **filed** Jan. 5, 1972, D.C., N.D. Tex. (Dallas), Doc. CA–3–5418–A, *Tampo Manufacturing Company, Inc.* v. *Shovel Supply Company, Inc.*

3,610,815, Gould, Lieberman and Sarabia, MOTION PICTURE FILM COLOR CORRECTION SYSTEM AND METHOD, **filed** Oct. 27, 1971, D.C., S.D.N.Y., Doc. 71–C–4680, *Teletronics International Inc.* v. *Columbia Pictures Industries, Inc.*

3,614,325, Galian and Kuryla, TELEPHONE AND SIGNALING SYSTEM, **filed** Nov. 12, 1971, D.C. Conn. (Bridgeport), Doc. B–405–C, *Totel Systems Corporation* v. *Teletron Systems, Inc. et al.*

3,616,743, V. Alter, VENTILATOR STRUCTURE, **filed** Nov. 4, 1971, D.C., W.D. Wis. (Madison), Doc. 71–C–429, *American Metal Climax, Inc.* v. *Wausau Metals Corporation.*

Certificates of Correction for the Week of Apr. 18, 1972

D. 221,662	3,596,962	3,610,359	3,615,971
Re. 26,494	3,597,189	3,610,393	3,615,981
3,425,846	3,597,359	3,610,462	3,615,990
3,443,940	3,598,146	3,610,657	3,616,025
3,488,319	3,598,305	3,610,846	3,616,051
3,494,121	3,598,631	3,610,937	3,616,199
3,502,972	3,598,658	3,611,003	3,616,201
3,505,289	3,599,099	3,611,101	3,616,202
3,509,019	3,599,536	3,611,347	3,616,231
3,523,151	3,599,739	3,611,381	3,616,236
3,527,745	3,600,621	3,611,403	3,616,278
3,529,988	3,600,999	3,611,418	3,616,294
3,541,964	3,601,397	3,611,939	3,616,372
3,542,854	3,601,442	3,612,000	3,616,517
3,549,643	3,601,464	3,612,103	3,616,530
3,551,447	3,601,504	3,612,109	3,616,534
3,555,802	3,601,567	3,612,177	3,616,637
3,558,785	3,601,678	3,612,324	3,616,848
3,563,189	3,601,680	3,612,349	3,616,866
3,564,067	3,601,932	3,612,780	3,616,919
3,564,951	3,603,153	3,612,731	3,617,094
3,565,213	3,603,243	3,613,071	3,617,129
3,565,706	3,603,401	3,613,080	3,617,181
3,565,949	3,603,446	3,613,222	3,617,240
3,566,047	3,603,767	3,613,264	3,617,322
3,566,727	3,603,787	3,613,731	3,617,334
3,567,833	3,603,819	3,613,943	3,617,372
3,570,772	3,603,821	3,613,947	3,617,381
3,571,748	3,604,340	3,614,028	3,617,395
3,572,902	3,604,417	3,614,059	3,617,406
3,576,046	3,604,444	3,614,216	3,617,475
3,576,360	3,604,648	3,614,311	3,617,675
3,576,813	3,605,008	3,614,436	3,617,721
3,576,921	3,605,215	3,614,438	3,617,770
3,579,189	3,605,499	3,614,476	3,617,778
3,580,272	3,605,960	3,614,584	3,617,842
3,582,183	3,606,175	3,614,655	3,617,881
3,582,524	3,606,516	3,614,696	3,617,983
3,582,629	3,606,901	3,614,728	3,618,105
3,583,644	3,606,903	3,614,758	3,618,326
3,584,944	3,607,068	3,615,104	3,618,608
3,585,603	3,607,139	3,615,184	3,618,678
3,586,785	3,607,151	3,615,233	3,618,857
3,586,955	3,607,231	3,615,244	3,618,913
3,590,378	3,607,270	3,615,269	3,618,958
3,590,960	3,607,282	3,615,319	3,618,961
3,591,402	3,607,716	3,615,322	3,619,285
3,591,890	3,607,831	3,615,327	3,619,384
3,593,104	3,608,472	3,615,342	3,619,488
3,593,580	3,608,527	3,615,559	3,619,598
3,593,721	3,608,542	3,615,647	3,619,742
3,594,071	3,608,581	3,615,662	3,619,772
3,594,286	3,608,821	3,615,667	3,621,356
3,594,327	3,609,092	3,615,715	3,622,245
3,594,587	3,609,405	3,615,736	3,622,375
3,595,707	3,609,467	3,615,763	3,624,019
3,596,165	3,609,487	3,615,793	3,631,910
3,596,410	3,610,009	3,615,796	
3,596,561	3,610,177	3,615,907	
3,596,568	3,610,339	3,615,943	

Dedications

3,214,361.—*Lynn A. Williams,* Winnetka, Ill. MULTIPHASE ELECTROLYTIC REMOVAL APPARATUS. Patent dated Oct. 26, 1965. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subequent to Dec. 24, 1971.

3,255,097.—*Lynn A. Williams,* Winnetka, Ill. METHOD AND APPARATUS FOR CLARIFYING ELECTROLYTE. Patent dated June 7, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,278,411.—*Lynn A. Williams,* Winnetka, Ill. ELECTROLYZING ELECTRODE. Patent dated Oct. 11, 1966. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,326,785.—*Lynn A. Williams,* Winnetka, Ill. ELECTROLYTIC POLISHING APPARATUS AND METHOD. Patent dated June 20, 1967. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicates to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

3,498,904.—*Lynn A. Williams,* Winnetka, Ill. ELECTRODE FOR ELECTROLYTIC SHAPING. Patent dated Mar. 3, 1970. Dedication filed Dec. 23, 1971, by the assignee, *Anocut Engineering Company.*

Hereby dedicate to the Public the portion of the term of the patent subsequent to Dec. 24, 1971.

Disclaimers

3,591,348.—*Harold E. La Belle, Jr.,* Quincy, Mass. METHOD OF GROWING CRYSTALLINE MATERIALS. Patent dated July 6, 1971. Disclaimer filed Mar. 25, 1971, by the assignee, *Tyco Laboratories, Inc.*

Hereby disclaims the portion of the term of the patent subequent to Oct. 7, 1986.

3,592,917.—*Ernest G. Jaworski,* Olivette, and *Gino J. Marco,* Webster Groves, Mo. ANIMAL FEED COMPOSITIONS AND METHODS. Patent dated July 13, 1971. Disclaimer filed Jan. 18, 1971, by the assignee, *Monsanto Company.*

Hereby disclaims the portion of the term of the patent subsequent to Jan. 5, 1988.

3,627,545.—*Glenn O. Mallory, Jr.,* Inglewood, and *Donald W. Baudrand,* Temple City, Calif. BATH AND PROCESS FOR CHEMICAL METAL PLATING. Patent dated Dec. 14, 1971. Disclaimer filed Mar. 1, 1971, by the assignee, *Allied Research Products, Inc.*

Hereby disclaims the portion of the term of the patent subsequent to Aug. 3, 1988.

3,630,649.—*John Hancock,* Leeds and *Albert Westerman,* Normanton, England. SHROUDED GAS BURNERS AND JETS THEREFOR. Patent dated Dec. 28, 1971. Disclaimer filed May 4, 1971, by the assignee, *Geo. Bray & Company Limited.*

Hereby disclaims the portion of the term of the patent subsequent to Apr. 22, 1986.

3,631,215.—*Everett Clippinger,* San Rafael, and *Bernard F. Mulaskey,* Fairfax, Calif. PLATINUM COMPONENT-TIN COMPONENT-ALUMINA CATALYTIC COMPOSITE AND AROMATIZATION PROCESS USING SAME. Patent dated Dec. 28, 1971. Disclaimer filed Mar. 26, 1971, by the assignee, *Chevron Research Company.*

Hereby disclaims the portion of the term of the patent subsequent to Sept. 29, 1987.

Disclaimer and Dedication

3,612,063.—*Theodore S. Briskin* and *Geoffrey R. Ward,* Beverly Hills, Calif. OXIDIZED CELLULOSE SMOLING PRODUCT. Patent dated Oct. 12, 1971. Disclaimer and dedication filed Apr. 8, 1971, by the assignee, *Sutton Research Corporation.*

Hereby disclaims and dedicates to the Public the portion of the term of the patent subsequent to Feb. 2, 1988.

Adverse Decision in Interference

In the designated interference involving the indicated claims of the patent, final decision has been rendered that the patentee is not the first inventor with respect to the claims listed.

Patent No. 3,225,127, J. N. Scott, Jr., BLOW MOLDING FOAM BOTTLES, decided Mar. 29, 1971, Interference No. 96,602, claims 1–8.

Patents Available for Licensing or Sale

2,995,619. SYSTEM OF TELEVISION TRANSMISSION AND PHOTOGRAPHIC REPRODUCTION OF THE TELEVISED IMAGE. Samuel Freeman, 13 Birchwood Court, E., Syossett, N.Y., 11791.

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poincianna Drive, Martinez, Ga., 30907.

3,574,451. SPECTACLE FRAME. Archille Lazazzera, 48 Moherman Ave., Youngstown, Ohio, 44509.

3,601,211. STEERING ARRANGEMENT FOR A TRACK LAYING VEHICLE. Voith Getriebe KG, Brenz, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,620,546. GOLF CART WITH CLUB RACK FOLDABLE BY HANDLE. John H. Andersen, 75 Huntington Road, Stratford, Conn., 06497.

3,621,155. STEREO PILLOW. Jackson L. Pruitt, 33129 Lake Mead Drive, Freemont, Calif.

3,625,664. PROCESS FOR THE PRODUCTION OF RICH FUEL TO REPLACE NATURAL GAS BY MEANS OF CATALYTIC HYDROGASIFICATION UNDER PRESSURE OF FLUID HYDROCARBONS. Carlo Padovani. Correspondence to: Murphy & Dobyns, 2001 Jefferson Davis Highway, Suite 307, Arlington, Va., 22202.

3,627,007. TITAL AXE. Alfred H. Rieffer, 336 E. Alluvial Ave., #146, Fresno, Calif., 93710.

3,631,441. LAMP FAILURE INDICATOR. Herman H. Murphy, 3870 Highland Ave., San Diego, Calif., 92105.

3,633,915. GAME OF CHANCE. Henry E. Lippert, 130 SW. 12th St., Miami, Fla., 33130.

3,634,942. PROPORTION SCALER. Raymond Nicyper, Birch Hill, Weston, Conn., 06880.

3,635,225. ASH TRAY. Malcolm C. Andrews, Correspondence to: Sherman Levy, Suite 635, Washington Bldg., 15th and New York Ave. NW., Washington, D.C., 20005.

The following 2 patents are offered by: Philip Bohannon, 2802 W. Sitka St., Tampa, Fla., 33614.

3,479,106. WIG STAND.

3,628,655. CONVERTIBLE WIG CASE.

The following 11 patents are available for licensing. Inquiries should be directed to: Mr. Rano J. Harris, Jr., President, Precision Sampling Corp., 8275 W. El Cajon, Baton Rouge, La., 70815.

2,991,647. CHROMATOGRAPHY.

3,205,711. SAMPLE INJECTION IN GAS CHROMATOGRAPHY.

3,279,659. INJECTION APPARATUS.

3,306,502. APPARATUS FOR INJECTION OF FLUIDS.

3,355,950. CHROMATOGRAPHIC SAMPLE INJECTION APPARATUS.

3,385,113. MULTIPORT VALVES.

3,474,674. LIQUID INJECTION APPARATUS.

3,482,450. SAMPLE INLET SYSTEMS FOR ANALYTICAL INSTRUMENTS.

3,528,641. TUBULAR VALVE.

3,542,072. VALVE.

3,603,471. SEPTUM VALVES.

General Electric Company is prepared to grant non-exclusive licenses under the following 126 patents.

Applications for license under the following patent may be addressed to: Patent Counsel, LSTG-I & MT Division, General Electric Company, 1 River Road, Bldg. #43, Schenectady, N.Y., 12305.

3,604,967. LIQUID METAL COLLECTOR VELOCITY DIVIDER.

Applications for licenses under the following patent should be addressed to: Division Patent Counsel, Space Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

3,640,487. VERTICAL ORIENTATION DEVICE.

Applications for licenses under the following 2 patents should be addressed to: Patent Counsel, General Electric Co., 22255 Greenfield Road, Southfield, Mich., 48075.

3,549,418. MAGNETIC RECORDING FILMS OF COBALT.

3,575,825. METHOD OF INCREASING THE COERCIVE FORCE OF COBALT-TUNGSTEN FILMS BY ANODIC TREATMENT.

Applications for licenses under the following 3 patents should be addressed to: General Electric Company, Patent Counsel, Housewares Business Div., 1285 Boston Ave., Bridgeport, Conn., 06602.

2,755,574. CONTROL FOR COMBINATION DRY AND STEAM FLATIRON.

3,397,975. STEAM IRON BAFFLING.

3,593,441. STEAM IRON METALLIC SEALING STRUCTURE.

Applications for license under the following 6 patents should be addressed to: Division P Patent Counsel, Space Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

3,595,227. DIVING VEST.

3,594,301. SPUTTER COATING APPARATUS.

3,581,234. BIAS AND TEMPERATURE COMPENSATING CIRCUIT FOR TUNNEL DIODE OSCILLATORS.

3,615,846. FLUID EXPANSION BLADDER.

3,618,380. CONTINUOUS DISCHARGE DRIVER FREE-PISTON SHOCK TUNNEL.

3,620,817. SURFACE PREPARATION ON BORON FILAMENTS FOR ADHESIVE APPLICATIONS.

Applications for license under the following 24 patents may be addressed to: Patent Counsel, Electronics Laboratory, General Electric Co., Bldg. 3, Room 216, Electronics Park, Syracuse, N.Y., 13201.

2,997,659. SEMICONDUCTOR DIODE AMPLIFIER.

3,041,552. FREQUENCY CONTROLLED OSCILLATOR UTILIZING A TWO-TERMINAL SEMICONDUCTOR NEGATIVE RESISTANCE DEVICE.

3,060,252. ENCAPSULATED THERMOELECTRIC ELEMENTS.

3,064,145. VARIABLE TRANSISTOR CIRCUIT DISCHARGING A STORED CAPACITANCE FROM A LOAD.

3,070,644. THERMOELECTRIC GENERATOR WITH ENCAPSULATED ARMS.

3,089,094. REGULATED PEDESTALLED GRID BIAS SUPPLY.

2,787,707. PULSE GENERATOR.

2,816,236. METHOD OF AND MEANS FOR DETECTING STRESS PATTERNS.

2,826,647. TRANSISTOR TETRODE AMPLIFIER A.G.C. SYSTEM.

2,838,669. COUNTING NETWORK.

2,844,644. DETACHABLE SPRING CONTACT DEVICE.

2,845,616. COMMUNICATION CODING AND DECODING APPARATUS.

2,863,008. STABILIZED AMPLIFIER.

2,863,068. SIGNAL RESPONSIVE NETWORK.

2,864,062. NEGATIVE RESISTANCE USING TRANSISTORS.

2,911,595. RELAXATION OSCILLATORS AND CONTROL METHOD THEREFOR.

2,923,834. MAGNETIC DELAY ELEMENT.

2,951,996. VARIABLE TRANSMISSION NETWORK.

2,952,773. STABLE WAVEFORM GENERATOR.

2,955,171. SYMMETRICAL DIODE LIMITER.

3,960,613. NON-LINEAR RESONANCE DEVICES.

2,963,593. CROSS-COUPLED MULTIVIBRATOR SELECTIVELY OPERABLE EITHER MONOSTABLY OR BISTABLY.

2,976,429. SEMICONDUCTOR CIRCUITS UTILIZING A STORAGE DIODE.

2,981,881. SEMICONDUCTOR CIRCUITS.

Applications for license under the following 36 patents may be addressed to: Division Patent Counsel, Electronic Systems Division, General Electric Company, Bldg. 3, Room 216, Electronics Park, Syracuse, N.Y., 13201.

3,112,471. VOLTAGE CONTROLLED MAGNETIC SYSTEM.

3,202,990. INTERMEDIATE FREQUENCY SIDE-LOBE CANCELLER.

3,202,991. ELECTRONIC SCANNING OF LARGE ARRAYS.

3,218,559. SYNCHRONIZING CIRCUIT MAINTAINING LOOP SIGNALS AS AN INTEGER PRODUCT AND EQUAL AMPLITUDE.

3,222,644. SIMPLIFIED ERROR-CONTROL DECODER.

3,230,483. ANCHOR-SLOT WAVEGUIDE COUPLING APERTURE.

3,237,160. SEMICONDUCTOR MULTIPLE-WORD CORRELATOR.

3,246,130. EXTRAPOLATION COMPUTER USING REVERSIBLE COUNTER FOR TRAJECTORY MEASUREMENT.

3,258,774. SERIES-FED PHASED ARRAY.

3,264,248. ENCAPSULATING COMPOSITIONS CONTAINING AN EPOXY RESIN, METAXYLYLENE DIAMINE, AND TRIS-BETA CHLORETHYL PHOSPHATE, AND ENCAPSULATED MODULES.

3,308,457. RADAR TRACKING AMPLIFYING SYSTEM.

3,375,405. CIRCUIT FOR REMOVING VOLTAGE SURGES FROM POWER LINES.

3,377,571. RADIO FREQUENCY DIRECTIONAL COUPLER UTILIZING CROSSED COUPLING SLOTS OF UNEQUAL DIMENSIONS.

3,380,053. DUPLEXING MEANS FOR MICROWAVE SYSTEMS UTILIZING PHASED ARRAY ANTENNAS.

3,384,891. METHOD AND SYSTEM FOR LONG DISTANCE NAVIGATION AND COMMUNICATION.

3,385,982. HIGH POWER SOLID STATE PULSE GENERATOR WITH VERY SHORT RISE TIME.

3,396,377. DISPLAY DATA PROCESSOR.

3,403,394. DIVERSITY RADAR SYSTEM.

3,406,329. PARALLEL INVERTER WITH RAPID RESPONSE TIME TO CHANGES IN PULSE DURATIONS.

3,418,241. PROCESS FOR MAKING ALUMINUM-CONTAINING FERRITES.

3,421,088. FREQUENCY SHIFT KEYING BY DRIVING INCREMENTAL PHASE SHIFTER WITH BINARY COUNTER AT A CONSTANT RATE.

3,422,428. MOVING-TARGET-RESPONSIVE RADAR SYSTEM.

3,426,241. MAGNETIC DEFLECTION SYSTEM FOR CATHODE RAY TUBES.

3,430,162. BROAD BAND HIGH POWER PULSE TRANSFORMER.

3,444,556. ELECTRONIC PHASE-DIFFERENCE COUNTER CIRCUIT.

3,447,626. SEISMIC SENSOR FOR EARTH MOVEMENT CAUSED BY A DETONATION.

3,450,153. ELECTRICAL PULSE GENERATOR AND REGULATOR FOR FLUID FLOW AND LIKE CONTROL SYSTEMS.

3,452,278. APPARATUS FOR ELECTRICAL WAVEFORM ANALYSIS.

3,452,281. TRANSISTOR AMPLIFIED CIRCUIT HAVING DIODE TEMPERATURE COMPENSATION.

3,453,539. APPARATUS FOR SEQUENTIALLY MONITORING ELECTRICAL VOLTAGES INCLUDING A CAPACITOR TRANSFER SYSTEM AND MARGINAL PREDICTION MEANS.

3,457,529. TEMPERATURE COMPENSATION OF CRYSTAL CONTROLLED CIRCUIT.

3,460,145. ELECTRONIC SCANNING SYSTEM FOR WAVE ENERGY BEAM FORMING AND STEERING WITH RECEPTOR ARRAYS.

3,465,207. PROTECTION CIRCUIT FOR SCR PULSE GENERATOR.

3,466,564. AMPLIFIER UNIT COMBINED WITH EXTERNALLY MOUNTED COMPONENTS FOR ESTABLISHING OPERATING CHARACTERISTICS THEREOF.

3,482,186. LASER OSCILLATOR WITH SINGLE TRANSVERSE MODE OUTPUT.

3,484,937. METHODS AND APPARATUS FOR FIXING INTERFACE PINS IN ELECTRICAL CIRCUIT BOARDS.

Applications for license under the following 52 patents should be addressed to: Manager, Technology Marketing Operation, General Electric Co., 1 River Road, Schenectady, N.Y., 12305.

3,320,097. RESEALABLE VENT FOR A SEALED CASING.

3,352,775. TUBE-TO-TUBE REACTOR.

3,410,993. FLEXIBLE SIGNAL AVERAGING METHOD AND APPARATUS.

3,414,702. NONTHERMIONIC ELECTRON BEAM SOURCE.

3,417,222. APPARATUS FOR HOLDING ELECTRICALLY NON-CONDUCTIVE MATERIAL AND IMPROVING ELECTRON BEAM CUTTING THEREOF.

3,424,953. ELECTROKINETIC TRANSDUCER WITH ION SCAVENGING.

3,432,349. ELECTRIC STORAGE CELL.

3,451,054. LIGHT OPTIC DIGITAL TRANSDUCER USING DISPLACED RONCHI RULINGS.

3,474,426. REVERSAL OF MAGNETIC CORE POLARIZATION.

3,478,494. VORTEX-ELECTROSTATIC SEPARATOR.

3,482,913. METHOD AND APPARATUS FOR COMPOSING AND ENLARGING 3-D PICTURES.

3,483,350. ELECTRON BEAM DETECTION AND STEERING SYSTEM.

3,483,529. LASER LOGIC AND STORAGE ELEMENT.

3,504,059. METHOD AND APPARATUS FOR MAKING THREE DIMENSIONAL PICTURES.

3,508,920. THREE DIMENSIONAL PICTURES AND METHOD OF MAKING.

3,504,953. FOIL BEARING.

3,516,728. INFRARED INTENSITY MODULATOR "WHEREIN OPTICAL ABSORPTION SPECTRUM OF CADMIUM TELLURIDE DOPED WITH IRON IONS VARIED."

3,518,929. THREE DIMENSIONAL CAMERA.

3,519,481. METHOD FOR FORMING THIN FILMS HAVING SUPERCONDUCTIVE CONTACTS.

3,522,046. THREE DIMENSIONAL COLOR PICTURES AND METHOD OF MAKING.

3,532,426. HOLOGRAPHIC FINGERPRINTING IDENTIFICATION.

3,532,591. ETCHING SILICIDE.

3,533,339. COLOR DISPLAY SYSTEM AND METHOD EMPLOYING LIGHT SENSITIVE RECORD.

3,534,164. METHOD AND APPARATUS FOR PRODUCING 3-D PICTURES UTILIZING A SCANNING BEAM.

3,534,588. SYSTEM FOR DETECTING LOOSE PARTS.

3,534,813. HEAT EXCHANGER.

3,538,396. COULOMETER WITH AT LEAST ONE ELECTRODE CONTAINING AN EXCESS OF CADMIUM HYDROXIDE.

3,541,532. SUPERCONDUCTING MEMORY MATRIX WITH DRIVE LINE READOUT.

3,549,806. FUNDAMENTAL PITCH FREQUENCY SIGNAL EXTRACTIONS SYSTEM FOR COMPLEX SIGNALS.

3,549,883. SCANNING ELECTRON MICROSCOPE "WHEREIN AN IMAGE IS FORMED AS A FUNCTION OF SPECIMEN CURRENT."

3,549,957. ELECTROCHEMICAL CELL WITH ELECTRON EXCHANGE MEMBRANE BETWEEN SOLUTIONS IN COMPARTMENTS.

3,550,084. SYSTEM AND METHOD FOR IDENTIFYING A SET OF GRAPHIC CHARACTERS GROUPED TOGETHER ON A VISIBLE INFORMATION DISPLAY.

3,555,347. SELF-ALIGNING ELECTRON BEAM WELDER.

3,556,749. APPARATUS AND METHOD FOR THE HYDROGENATION OF COAL.

3,558,920. BISTABLE PHOTOSENSITIVE DEVICE UTILIZING TUNNEL CURRENTS IN LOW RESISTIVE STATE.

3,607,125. REFORMER TUBE CONSTRUCTION.

3,564,266. PHOTOELECTRIC FINGERPRINT RIDE COUNTER.

3,565,683. COATED FILAMENTS.

3,566,137. HOLOGRAPHIC CHARACTER READER.

3,567,598. RENDERING THE SURFACE OF MOLYBDENUM AND TUNGSTEN COMPOSITIONS SOFT-SOLDERABLE.

3,581,280. HOLOGRAPHIC SPATIAL FILTERS AND METHOD OF MAKING SAME.

3,589,184. CONTINUOUS-FLOW CALORIMETER.

3,342,721. APPARATUS FOR TREATING LIQUIDS IN AN ELECTRICAL DISCHARGE INCLUDING MEANS FOR DIRECTING THE LIQUID IN A CONTINUOUS CURTAIN.

3,356,602. PROCESS OF DIMERIZING CARBOXYLIC ACIDS IN A CORONA DISCHARGE.

3,402,119. UNITARY CORONA REACTOR.

3,415,683. CORONA DISCHARGE COATING PROCESSES.

3,496,092. SOLID STATE CORONA GENERATOR FOR CHEMICAL-ELECTRIC DISCHARGE PROCESSES.

3,590,508. TRAVELING SIGN CONTROLLED BY LOGIC CIRCUITRY AND PROVIDING A PLURALITY OF DIGITAL DISPLAY EFFECTS.

3,534,589. FREE PARTICLE AND LOOSE OBJECT DETECTION SYSTEM.

3,592,473. DICE GAME HAVING TRULY RANDOM NUMBER GENERATION.

3,598,177. CONDUIT HAVING A ZERO CONTACT ANGLE WITH AN ALKALI WORKING FLUID AND METHOD OF FORMING.

3,598,955. ELECTRICAL CONTACT FOR MOVING FILAMENTS.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 21, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-11-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-04-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-25-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-01-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods: Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-01-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	7-21-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	2-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-03-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-01-71
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-06-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	1-06-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	2-03-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	1-08-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-04-71
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	3-17-71
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	2-03-71

Expiration of patents: The patents within the range of numbers indicated below expire during April 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,705,322 to 2,707,276, inclusive
Plant Patents..... Numbers 1,374 to 1,388, inclusive

PLANT PATENTS

GRANTED APRIL 18, 1972

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,112
ROSE PLANT

Gijsbert Verbeek, Hornweg 109, Aalsmeer, Netherlands

Filed Jan. 7, 1970, Ser. No. 1,330
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—18 1 Claim

A rose plant of the hybrid tea class, particularly for the greenhouse, originated by crossing the variety known as Miracle (Plant Patent No. 1,863) with the variety known as Dr. A. J. Verhage (synonym Golden Wave) (Plant Patent No. 2,105).

3,113
ROSE PLANT

John W. Patterson, Houston, Tex., assignor to Patterson Roses, Houston, Tex.

Filed Feb. 2, 1970, Ser. No. 8,100
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—19 1 Claim

1. A new and distinct variety of rose of the grandiflora class, substantially as herein shown and described characterized particularly as to the unique combination of good growing and flower producing habits, soft green foliage, relatively large beautiful flowers, of good form at all stages of bloom, moderate fragrance, better than average disease resistance, good, vigorous upright bush, a distinctive and attractive color tonality of the flowers, corresponding to Spinel Red, Plate 0023, page 189, in newly opened flowers and Spinel Red, Plate 0023 to Spinel Red, Plate 0023/1, page 189 in three days open flowers, with a small amount of Yellow Ochre, Plate 07/1, at the bases of petals in the center of the flower glowing throughout, to classify the variety as a blend.

3,114
MOUNTAIN ASH TREE

Milton Baron, East Lansing, Mich., assignor to J. Frank Schmidt and Son Co., Troutdale, Oreg.

Filed Feb. 13, 1970, Ser. No. 11,359
Int. Cl. A01h *5/12*
U.S. Cl. Plt.—51 1 Claim

1. A new and distinct variety of mountain ash tree of the European mountain ash species botanically known as *Sorbus aucuparia,* substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a heavier and straighter tree trunk structure, a better central leader which extends well into the top of a medium dense tree crown which has an oval silhouette shape, a more vigorous and rapid habit of growth normally averaging 2 or more feet per year and with a capability of attaining a mature tree height of about 30 feet, while progeny trees derived from buddings produce whips of 6 or 7 feet tall in 1 year, the production of heavier, larger and more highly ornamental fruit clusters, an earlier fruit maturing habit, occurring by mid-July and which is at least 1 month earlier than is normal of the species when grown under the same conditions, and a distinctive and highly attractive deep rich red fruit color.

3,115
ROSE PLANT

Eldon C. Curtis, Dallas, Tex., assignor to E. V. Kimbrew, Van Zandt County, Tex.

Filed Feb. 24, 1970, Ser. No. 13,868
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—18 1 Claim

A new and distinct variety of hybrid tea rose plant produced by crossing Hawaii (Plant Patent No. 1,833) on Montezuma (Plant Patent No. 1,383).

3,116
AVOCADO TREE

Harold E. Kendall, P.O. Box 458, Goulds, Fla. 33170

Filed Mar. 6, 1970, Ser. No. 17,350
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—44 1 Claim

1. The new and distinct variety of avocado tree, substantially as shown and described, characterized particularly by its vigorous, thrifty, upright but freely branching growth; the tendency of the fruit to grow on the inside of the tree; the early blooming and seeding of heavy crop of fruit early each year and carrying crop to maturity late in the season; the fruit being further characterized as from oblong-ovate to slightly pyriform with flesh of smooth texture, free of fibre and excellent buttery taste.

3,117
AVOCADO TREE

Harold E. Kendall, P.O. Box 458, Goulds, Fla. 33170

Filed Mar. 9, 1970, Ser. No. 17,987
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—44 1 Claim

1. The new and distinct variety of avocado tree, substantially as shown and described, characterized particularly by its vigorous, fast, upright but freely branching growth; a flowering period in late March and early April; its fruit maturing each year in December and early January; the fruit being further characterized as small to medium size and oblong-ovate with flesh of smooth texture free of fibre and excellent buttery flavor.

3,118
ROSE PLANT

Eugene S. Boerner, deceased, late of Benton, N.Y., by Lincoln Rochester Trust Co., Rochester, N.Y., and Roger L. Boerner, Milwaukee, Wis., executors, assignors to Jackson & Perkins Company, Newport Beach, Calif.

Filed Mar. 10, 1970, Ser. No. 18,356
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—22 1 Claim

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a vigorous, well-branched and compact habit of growth of the floribunda type, a free-blooming habit throughout the season, medium size flowers which are borne in small clusters and on lateral branches usually singly to a stem, and a distinctive, attractive and unusual

flower color of Chinese Yellow which ages to Spinel Red on the outer edges of the petals at first, but later progressing to the center of the flower as the flower ages.

3,119
POINSETTIA PLANT
Paul Ecke, Encinitas, Calif., assignor to Paul Ecke Inc., Encinitas, Calif.
Filed Mar. 11, 1970, Ser. No. 18,771
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of an ability to propagate very well by vegetative cuttings, a very vigorous, tough and durable plant habit of medium height and having the ability to grow well as a multiple stem and multiple bloom plant, a very vigorous and extensive root system, a good branching habit, stiff stems which do not require staking, very pointed and attractive dark green foliage, many very wide bracts which give the plant a full and complete appearance, retention of the bracts, foliage and influorescences for an unusually long period of time after reaching maturity, a habit of not requiring light to delay bud set, a habit of setting buds quite easily under higher night temperatures and longer day lengths than other poinsettia varieties, a good pinching habit which produces 3 or more breaks, a normally later blooming habit than other varieties, but having the ability to be satisfactorily brought into bloom and full maturity in every month of the year through the exercise of proper greenhouse cultural techniques, a distinct and attractive slightly ruffled appearance of the bracts and their absence of any tendency to droop with age, a distinctive and attractive creamy white bract color, absence of drooping and retention of the influorescence position relative to the bracts without rising as occurs in other varieties as the inflorescences approach maturity, and excellent keeping qualities with consequent suitability for home decoration.

3,120
POINSETTIA PLANT
Paul Ecke, Encinitas, Calif., assignor to Paul Ecke, Inc., Encinitas, Calif.
Filed Mar. 11, 1970, Ser. No. 18,772
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized particularly as to novelty by a unique combination of characteristics which are substantially identical in all respects to those of the poinsettia variety known as #C–1 (Plant Patent No. 2,923) except for its bract color, said bracts being a distinctive and attractive pink color corresponding to near Delft Rose, as distinguished from the normal red color of the bracts of the variety #C–1.

3,121
APPLE TREE
Alvah Taylor, Selah, Wash., assignor to Stark Bro's Nurseries & Orchards Company, Louisiana, Mo.
Filed Apr. 16, 1970, Ser. No. 29,310
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct variety of apple tree, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a general resemblance to the parent variety "Rome Beauty" (unpatented), but having more upright, less weeping and thicker limbs, a much heavier fruit spur system throughout the tree, a habit of beginning the production of fruit at an earlier age, with continued heavy production thereafter, an earlier fruit coloring habit, with the fruit color being fully developed as a full blush without stripes by the time of harvest maturity and usually grading substantially 100% "extra fancy" for color, and a distinctive, attractive, full and bright cherry red fruit color completely free of striping.

3,122
POINSETTIA PLANT
Josef Holm, Stokke, Norway, assignor to Mikkelsens Inc., Ashtabula, Ohio
Filed Apr. 17, 1970, Ser. No. 29,711
Int. Cl. A01h *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein shown and described, characterized as to novelty by the unique combination of a rapid and strong rooting habit, compact foliage of good color and texture, faster and easier flowering as single stem plants, a habit resulting in a large number of side shoots when stopped by removing the terminal bud, with these being flowered uniformly and symmetrically, a habit permitting the profuse production of cuttings which consistently propagate rapidly, a symmetrical involucre, attractive bright red bracts, rapid and uniform flowering in both single and multiple flowering plants, and long lasting and rugged plant qualities.

3,123
STRAWBERRY PLANT
Harold A. Johnson, Jr., and Harold E. Thomas, Watsonville, Calif., assignors to Driscoll Strawberry Associates, Inc., Watsonville, Calif.
Filed Apr. 17, 1970, Ser. No. 29,712
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—49 **1 Claim**

1. The new and distinct variety of strawberry plant herein described and illustrated, and identified by the characteristics enumerated above.

3,124
GRAPEVINE
John M. Garabedian, 3158 Hamilton St., Fresno, Calif. 93712
Filed Apr. 29, 1970, Ser. No. 33,110
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—47 **1 Claim**

A large to medium size, vigorous grapevine, having mostly long canes, which is a regular and productive bearer of red table grapes—of superior eating quality—borne in usually conical, large to medium size clusters wherein the individual berries are usually large; the berries, which are mostly ellipsoidal, ripen about one week earlier than the Cardinal (unpatented), have firmer, more meaty flesh, less watery juice, a vinous to neutral flavor, a sweet taste attributable to a higher sugar content, and seeds which are smaller.

3,125
ALMOND TREE
Frederic W. Anderson, Merced, Calif., assignor to Arthur Bright, Le Grand, Calif.
Filed May 4, 1970, Ser. No. 34,643
Int. Cl. A01h *5/03*

U.S. Cl. Plt.—30 **1 Claim**

A large, vigorous, open, medium to upright almond tree having abundant foliage with large to medium size ovate leaves, heavy white bloom, and well distributed, medium size, well sealed nuts borne regularly and heavily, and which nuts harvest early and approximately with the Nonpareil (unpatented).

3,126

ROSE PLANT

Roy L. Byrum, Richmond, Ind., assignor to Joseph H. Hill Company, Richmond, Ind.

Filed June 1, 1970, Ser. No. 42,610
Int. Cl. A01h 5/00
U.S. Cl. Plt.—18 1 Claim

A new variety of hybrid tea rose suitable for year around greenhouse forcing and distinguished by its continuous free production of large sized blooms having excellent petal texture, a pleasing coloration, extending from French Rose to Porcelain Rose, unusually strong and long stems, and a vigorous growth habit.

3,127

PEACH TREE

Wilton L. Staggs and Sam E. Staggs, both of Rte. 2, Campobello, S.C. 29322

Filed June 14, 1967, Ser. No. 646,133
Int. Cl. A01h 5/03
U.S. Cl. Plt.—43 1 Claim

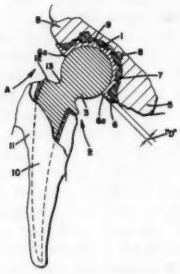
1. A new and distinct variety of peach tree substantially as shown and described characterized particularly as to novelty by its outstanding fruit which ripens at midseason between the Loring peach and the Blake peach with firm fully colored fruit with excellent shipping qualities being of excellent size, attractive color and good flavor.

PATENTS

GRANTED APRIL 18, 1972

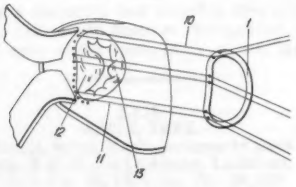
GENERAL AND MECHANICAL

3,656,184
ARTIFICIAL HIP JOINT
Harold Victor Chambers, R.R. 7, Brantford, Ontario, Canada
Filed Mar. 10, 1970, Ser. No. 18,267
Claims priority, application Canada, Mar. 13, 1969, 045,568
Int. Cl. A61f 1/24
U.S. Cl. 3—1 **9 Claims**



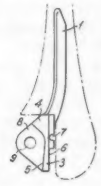
An artificial hip joint comprising a socket member and an inter-fitting ball member, in which dislocation of the joint is positively prevented by retaining means forming part of the socket member. The retaining means are constituted by extensions of the socket member beyond its diametral plane which define an opening into the socket smaller than that of the socket at the diametral plane. The ball member is shaped to pass through the socket opening at one particular orientation, for fitting the parts together, but once in place and orientated in normal positions of use the ball member cannot be removed from the socket.

3,656,185
CARDIAC VALVULAR SUPPORT PROSTHESIS
Alain F. Carpentier, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France
Filed Feb. 4, 1970, Ser. No. 8,564
Claims priority, application France, Feb. 4, 1969, 6902441
Int. Cl. A61f 1/24
U.S. Cl. 3—1 **6 Claims**



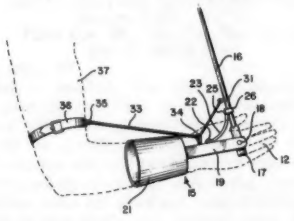
A cardiac valvular prosthesis, e.g., for the mitral valve, consisting solely of an annular or part-annular member adapted to fit against the base of the cusps of a human heart valve, and suture means for securing the member in place. The prosthesis cooperates with the natural valve cusps of the patient to form the valve.

3,656,186
ELBOW JOINT PROSTHESIS
Roger Dee, London, England, assignor to National Research Development Corporation, London, England
Filed Feb. 10, 1970, Ser. No. 9,678
Claims priority, application Great Britain, Feb. 18, 1969, 8,855/69
Int. Cl. A61f 1/24
U.S. Cl. 3—1 **4 Claims**



A prosthetic elbow joint device comprising a first arm curved in two mutually transverse planes and formed with a first hinge part at one end thereof, and a second arm curved in one plane and formed with a second hinge part at one end thereof, the arms and hinge parts being adapted for securement by cement with the first and second arms respectively located in the ulna and humerus in intramedullary manner, the first hinge part seated on a shoulder cut in the olecranon, and the two parts disposed for mutual pivotal connection.

3,656,187
ARTIFICIAL HAND WITH VIOLIN BOW ADAPTER
Edward A. Katz, 315 Avenue F, Brooklyn, N.Y.
Filed Nov. 25, 1970, Ser. No. 92,712
Int. Cl. A61f 1/06
U.S. Cl. 3—12.8 **6 Claims**



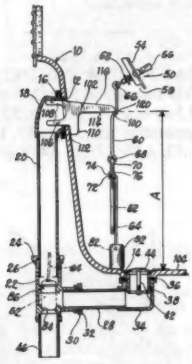
An artificial hand with a cuff-like sleeve adapted to be attached to the stub of the forearm and having a forwardly extending strut and artificial hand and with the strut extending into the palm of the artificial hand. On the end of the strut and pivotable in the palm of the artificial hand is a clamp holder to which the violin bow is releaseably attached. Means are provided between the bow and adapted for attachment to the upper arm of the player for keeping the bow pivoted as the upper arm of the player is lifted and perpendicular and across the strings of the violin as the violin is being played. This means for pivoting the bow holder takes the form of a combined spring biasing the bow outwardly from the strut and a string connected between the bow and the upper arm of the player for maintaining the bow in parallelism with the upper arm of the player and also in the form of articulated

links connected between the bow and the upper arm of the player and wherein the links pivotly connected together and held with this pivot connection located adjacent to the outer side of the elbow of the player's arm.

3,656,188
EXTERNALLY ADJUSTABLE BATHTUB WIRE SYSTEM AND MEANS FOR AND METHOD OF EXTERNALLY ADJUSTING SAME

Ralph E. Thorp, Lafayette, Ind., assignor to Globe Valve Corporation

Filed June 19, 1970, Ser. No. 47,731
Int. Cl. E03c *1/232*
U.S. Cl. 4—199 **7 Claims**

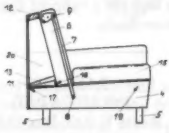


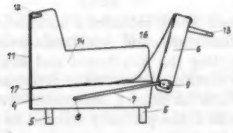
A substantially universal bathtub waste and overflow wire system having a plurality of articulated links, two of which are threaded to adjust the length of the wire system. The wire system defines a bench mark cooperable with a gauge juxtaposable in a predetermined relationship to an overflow opening. When the bench mark and gauge are aligned, the wire system is adjusted to just touch the tub floor. The wire system may then be installed in the tub fittings without requiring further adjustment.

3,656,189
CONVERTIBLE CHAIR

Ole Wiberg, c/o Lars Larsson, Vesterborgate 180, Copenhagen, Denmark

Filed Nov. 5, 1969, Ser. No. 874,335
Claims priority, application Great Britain, Nov. 5, 1968, 52,307/68
Int. Cl. A47c *17/16, 21/02*
U.S. Cl. 5—12 **2 Claims**



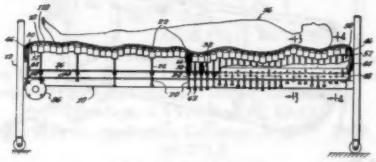


The invention relates to convertible settee-beds in which the backrest is connected with a base frame by a pair of side arms which are pivotally connected with both the backrest and the base frame in such a manner that the backrest can be swung from the backrest position at the back of the seat to the horizontal bed position in front of the seat.

3,656,190
BODY SUPPORT

John J. Regan, 2316 North Halem Avenue, Elmwood Park, Ill., and Bernard B. Rothstein, 6208 North Claremont Avenue, Chicago, Ill., assignors to said Regan, by said Rothstein

Filed Oct. 16, 1969, Ser. No. 866,934
Int. Cl. A47c *19/00*; A61g *7/00*
U.S. Cl. 5—60 **11 Claims**

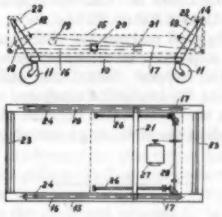


An apparatus for supporting a body in which the surface which engages the body is provided by a plurality of movable support elements. The weight of the body causes the elements to depress, forming a surface which conforms to the body contour. Means are provided to sequentially move groups of the support elements away from body contact, and then for returning these groups to a position supporting the body. Means are also provided for adjusting the sequential speed of the element groups. The sequential movement is designed to produce a wave-like movement of the support elements longitudinally along the body.

3,656,191
BEDSTEAD

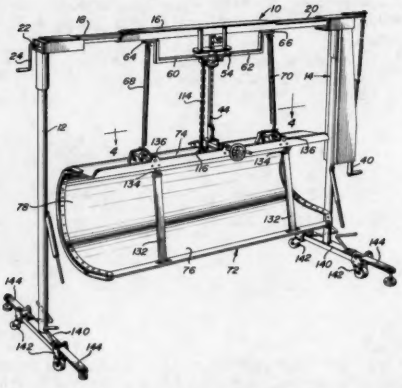
Finn Andre Kjellberg; Svend E. N. Lemvig, and Bent I. Kjellberg, all of Ronne, Denmark, assignors to Trioteam a/s, Ronne, Denmark

Filed July 30, 1970, Ser. No. 59,651
Claims priority, application Denmark, Aug. 4, 1969, 4192
Int. Cl. A61g *7/10*; A47c *3/32*
U.S. Cl. 5—63 **7 Claims**



The invention relates to a bedstead, the bottom of which is adjustable to various levels, and to oblique positions, said bottom being movably suspended in wires or chains secured to corner posts of a rigid undercarriage for the bed, the extremities of said wires or chains being carried to a cross-bar with propelling means for exerting a pull on the suspension chains or wires to effect adjustment of the bed bottom, all movable parts being built-in in a double-walled bedframe enclosing the undercarriage and its corner posts.

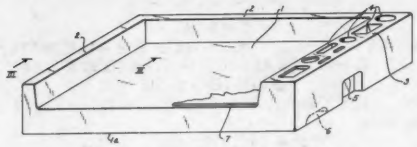
3,656,192
MOBILE PATIENT LIFT
Robert R. McGeoch, 414 Roosevelt, Missoula, Mont.
Filed Nov. 6, 1970, Ser. No. 87,562
Int. Cl. A61g *1/02, 7/10;* **A47b** *83/04*
U.S. Cl. 5—81 R **14 Claims**



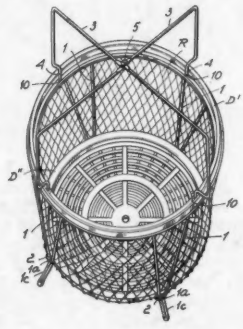
An overhead type lift including a pair of horizontally spaced apart upright standards interconnected at their upper ends by means of an adjustable length connecting beam. A generally one-half cylindrical or C-shaped horizontally opening cradle is suspended centrally intermediate its opposite ends between the standards by means of an adjustable length tension member operatively connected between the upper transverse connecting beam and the cradle at a point centrally intermediate its opposite ends. In addition, the lower ends of the uprights or standards are provided with supporting wheel means whereby the lift may be readily rolled from one location to another and the cradle enjoys a connection with the lower end of its supporting tension member whereby the cradle may be angularly adjusted about its longitudinal horizontal axis, even while suspended solely from the upper transverse beam by means of the aforementioned tension member. Still further, the cradle is rotatable about an upstanding axis relative to the supporting tension member and extending through the point of connection of the lower end of the tension member with the cradle and a horizontally disposed stabilizing beam is rotatably supported from the transverse support beam for oscillation about an upstanding axis passing through the mid-portion of the stabilizing beam and the point of suspension of the upper end of the tension member from the support beam, the stabilizing beam generally paralleling the cradle and elongated expansion type stabilizing springs being connected between the two pairs of corresponding ends of the stabilizing beam and cradle.

3,656,193
DRESSING TRAY FOR BABIES
Rudi Schneider Alter Berg; Lisa Schneider Alter Berg, and Werner Bauer Langegasse, all of Niederstetten, Germany
Filed Feb. 24, 1970, Ser. No. 13,616
Claims priority, application Germany, Feb. 26, 1969, P 19 09 822.7
Int. Cl. A47d *9/02, 5/00;* **A61g** *7/10*
U.S. Cl. 5—92 **3 Claims**

A rectangular structure of solid thermoplastic foam material comprises a planar surface for supporting a baby and upstanding flange portions on three sides of the structure for retaining the baby on the planar surface. One of the flange portions comprises discrete cavities at its upper surface for accommodating baby utensils.



3,656,194
PLAY-PEN FOR CHILDREN
Guiseppe Perego, Via Buonarroti 20043, Arcore, Italy
Filed July 6, 1970, Ser. No. 52,461
Claims priority, application Italy, Apr. 17, 1970, 23465 A/70
Int. Cl. A47c *27/08;* **A47d** *9/00*
U.S. Cl. 5—98 R **6 Claims**

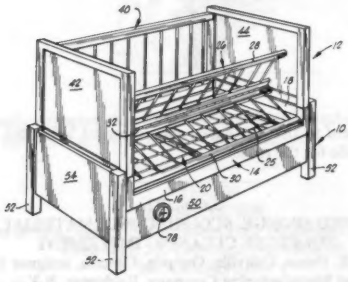


A playpen, foldable between an open position and a closed position, includes a one-piece molded plastic bottom and a one-piece molded plastic upper rim, with the upper rim being spaced above the bottom in the open position of the playpen. A nylon net is secured to respective hooks molded integrally with the bottom and with the upper rim, and forms the side walls of the playpen. Metal support legs are hingedly secured to the upper rim and are connected to the bottom by hooks having legs engaged in cylindrical sockets integral with the bottom. The upper rim is formed with integral cylindrical sockets to receive legs on a support structure for use in supporting toys or a sun-shade.

3,656,195
INFANT'S BED
Joseph R. Leahey, Route 1, P.O. Box 113, McLoud, Okla.
Filed Nov. 25, 1969, Ser. No. 879,678
Int. Cl. E03d *13/00*
U.S. Cl. 5—99 **1 Claim**

An infant's bed which includes a bottom section having a headboard, a footboard, and sideboards extending between and interconnecting the headboard and footboard. Resting on the bottom section and movably supported thereon is a top section which includes a horizontal rectangular frame having a first side fence pivotally secured to the rectangular frame for pivotation about a horizontal axis from an upstanding position to a horizontal position, and a second side fence pivotally secured to the rectangular frame on the opposite

side of the frame from the first side fence for pivotation about a horizontal axis from an upstanding position to a horizontal position immediately subjacent the first side fence when the first side fence is pivoted to a horizontal position. The top section further has a footboard pivotally secured to the frame for pivotation about a horizontal axis which extends generally perpendicular to the pivotal axis of the first side fence. A headboard is pivotally secured to the frame of the top section for pivotation about a horizontal axis extending substantially parallel to the pivotal axis of the footboard of the top section, and the footboard and headboard can be pivoted into horizontally extending, coplanar alignment immediately superjacent the first side fence. The top section is rollably supported on the bottom section for horizontal reciprocating movement, and a motor and pitman arm connection are provided for interconnecting the top section and the bottom section for driving the top section in reciprocation on the bottom section.



3,656,196

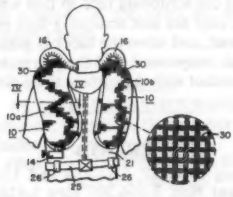
UNDERWATER BREATHING APPARATUS

Wilbur J. O'Neill, Severna Park, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 12, 1969, Ser. No. 832,670

Int. Cl. B63c *11/22*

U.S. Cl. 9—313 **4 Claims**



Diver worn breathing bags are covered with chain mail to counteract the positive buoyancy of the breathing bags and to afford armor protection for them.

3,656,197

REUSABLE SWAGING TAP

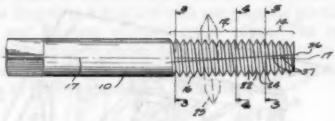
John M. Van Vleet, Hartland, Wis., assignor to Balax, Inc., North Lake, Wis.

Continuation-in-part of application Ser. No. 783,972, Dec. 16, 1968. This application Apr. 12, 1971, Ser. No. 133,238

Int. Cl. B21h *3/08;* **B23g** *7/00*

U.S. Cl. 10—152 **2 Claims**

The disclosed swaging tap has lobes or high points of its thread disposed on a helical spiral twist path of opposite hand to the thread, the angle of the reverse twist path with respect to the tap axis being either identical to the helical angle of the thread or at least materially less than twice the helical angle of the thread, the angle of the thread being by definition the angle between the thread crest and a plane normal to the axis.



3,656,198

FLOATING BRIDGE

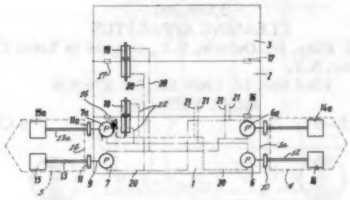
Klaus Haensgen, Witten, Germany, assignor to Lohmann & Stolterfoht Aktiengesellschaft, Witten, Germany

Filed Sept. 4, 1970, Ser. No. 69,622

Claims priority, application Germany, Sept. 17, 1969, P 19 48 071.8

Int. Cl. E01d *15/08*

U.S. Cl. 14—27 **7 Claims**



A floating bridge system with hinged, pivotable floats for folding and stacking them for overland transport and for spreading and unfolding them for floating. Pivoting of the floats is carried out through pumps disposed in the principle float, and operating in a closed system for pressurizing hydraulic actuators. The pumps are releasably connectable to amphibious tractors by means of shaft couplings.

3,656,199

SAFETY MECHANISM FOR A HYDRAULICALLY OPERATED DOCKBOARD

Robert R. Bregantini, Menomonee Falls, Wis., assignor to Kelley Company, Inc., Milwaukee, Wis.

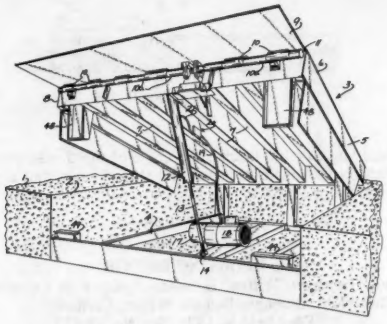
Filed Nov. 2, 1970, Ser. No. 85,901

Int. Cl. B65g *11/00*

U.S. Cl. 14—71 **9 Claims**

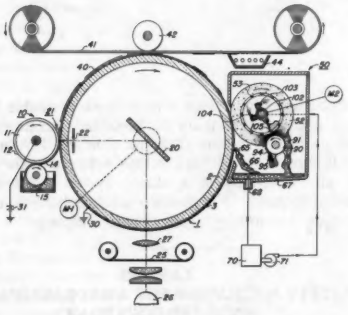
A safety mechanism to be incorporated with a hydraulically operated dockboard for preventing free descent of the ramp if a carrier pulls away from the dock when a load is on the ramp. The dockboard includes a ramp having its rear edge hinged to the dock and adapted to be raised upwardly to an inclined position by a hydraulic cylinder unit. The safety mechanism is located in the hydraulic supply line that supplies hydraulic fluid to the cylinder unit from a pump and the mechanism includes a pair of valves, one of which is biased to a normally closed position and the second valve is biased to a partially open position. To raise the ramp, the pump is operated and the pressurized fluid acts to move both valves to the fully open position. When the ramp is lowered in normal operation, the hydraulic fluid being displaced from the cylinder unit passes through the partially open second valve to provide a slow rate of descent from the ramp. If a

truck or carrier pulls away from the dock when a load is on the ramp, the combined weight of the ramp and the load will increase the force of the hydraulic fluid flowing from the cylinder to the pump, thereby overcoming the spring force



on the second valve and moving the second valve to a fully closed position. The closing of the second valve will prevent descent of the ramp and will retain the ramp in that position until the load is removed from the ramp.

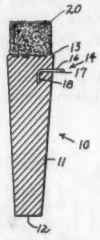
3,656,200
CLEANING APPARATUS
Bernard J. Riley, Jr., Ontario, N.Y., assignor to Xerox Corp., Rochester, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,930
Int. Cl. B08b *1/04*
U.S. Cl. 15—97 **9 Claims**



An improved cleaning mechanism for removing contaminants from generally non-porous surfaces. A sponge-like member surrounds a hollow perforated core. Sprayers, internal to the core, spray liquids under pressure to aid in removing contaminants from the sponge-like member. A pinch roll squeezes the sponge-like member against the core at a position where an internal baffle strip contacts the core. This seals the squeezed sponge-like member at the core preventing liquids and contaminants from passing the seal barrier formed.

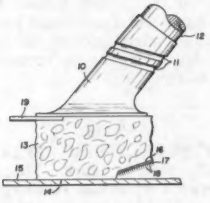
3,656,201
COMBINATION BLACKBOARD CHALK AND ERASER
Francisco O. Alcocer, Calle Arista 835, San Luis Potosi, S.L.P., Mexico
Filed Dec. 12, 1969, Ser. No. 884,503
Int. Cl. B43k *29/02*; B43l *21/00*
U.S. Cl. 15—118 **1 Claim**

A combined blackboard chalk and eraser in which the chalk is provided with an embedded eye to permit the chalk to be attached to a cord and suspended from the top of the blackboard. The chalk has an eraser element secured to one



end thereof so that the board can be erased, using the chalk as a handle for the eraser.

3,656,202
COMBINED SPONGE, SCOURING PILE MATERIAL AND SQUEEGEE CLEANING IMPLEMENT
Douglas E. Paton, Oakville, Ontario, Canada, assignor to The Schlegel Manufacturing Company, Rochester, N.Y.
Filed June 17, 1970, Ser. No. 46,867
Claims priority, application Canada, Feb. 3, 1970, 073,824
Int. Cl. A47l *13/12*
U.S. Cl. 15—121 **4 Claims**



A cleaning tool uses a block of foamed resin material having a scrubbing face and a recessed, stiff pile material arranged adjacent the scrubbing face so that when the block is pressed lightly, only the soft scrubbing face engages the surface to be cleaned, and when the block is pressed harder, the foam material is compressed, and the pile material is brought into scouring contact with the surface to be cleaned.

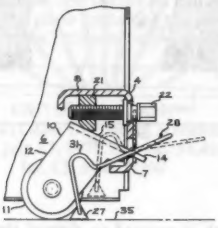
ERRATA

For Classes 15—147, 15—250 and 15—349 see: Patent Nos. 3,656,207 thru 3,656,209

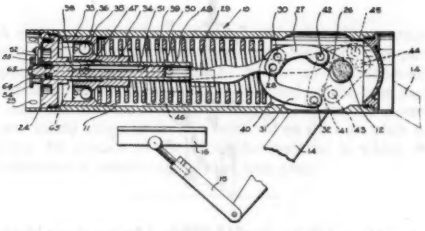
3,656,203
CASTER AND CASTER BRAKE STRUCTURE FOR APPLIANCES AND THE LIKE
Theodore A. Waflart, Jr., Louisville, Ky., assignor to General Electric Company
Filed Sept. 5, 1969, Ser. No. 855,624
Int. Cl. B60b *33/00*
U.S. Cl. 16—35 **2 Claims**

An appliance supporting caster structure includes a caster assembly adjustably mounted on a frame portion of the appliance. The caster assembly includes a U-shaped body member having a caster wheel rotatably mounted thereon. A brake means for the caster wheel comprises a chock and operating means for mounting the chock on the appliance frame for movement between a position in which the chock

blocks rolling movement of the wheel and an inoperative position. The operating means also includes a portion frictionally engaging the caster assembly body member for holding the chock in either of these positions.

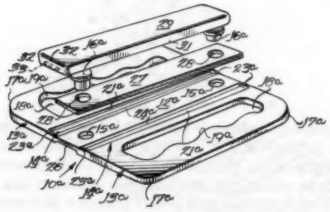


3,656,204
DOOR CLOSER
John Brown, Nowell Street, Kings Hill, Wednesbury, England
Filed Sept. 23, 1969, Ser. No. 860,249
Int. Cl. E05f *3/10*
U.S. Cl. 16—52 **8 Claims**



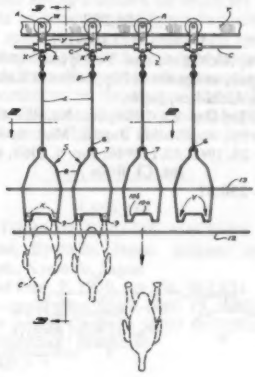
A door closer including a housing for attachment to the door frame, the housing carrying a rotatably mounted operating arm for attachment to the door, the housing containing spring means which is stressed axially in response to axial movement of a spring seating within the housing, the spring seating being coupled to the pivot for the operating arm through a linkage system.

3,656,205
PLASTIC LAY-DOWN HANDLE
Ralph F. Anderson, Rockford, Ill., assignor to Keystone Consolidated Industries, Inc., Peoria, Ill.
Filed July 22, 1970, Ser. No. 57,232
Int. Cl. A47b *95/02*
U.S. Cl. 16—125 **6 Claims**



A novel handle formed of a suitable plastic material which will open out flat when not in use is adapted to be secured to a case, box, luggage, or other object to be carried, by means of rivets or other suitable attaching means. The handle includes a pair of gripping members integral with an intermediate flat base and joined by grooved or narrowed hinge portions so as to allow the gripping members to open out in the same plane as the base when not in use, and when used, folded or hinged to a position with the gripping portions converging and meeting at their outer edges. The base has openings for securing means to join the handle to the article to be carried and the gripping members having elongated openings to receive the fingers of the user.

3,656,206
ARTICLE-RELEASE SHACKLE FOR TROLLEY-SUPPORTED HANDLING SYSTEMS TO FACILITATE PROCESSING
Glenn A. Klevgard, Faribault, Minn., assignor to Domain Industries, Inc., New Richmond, Wis.
Filed Jan. 9, 1970, Ser. No. 1,720
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **4 Claims**



A shiftable and article-releasable shackle for use with a trolley-supported handling system to facilitate processing, such as the evisceration of poultry, which utilizes a multiplicity of vertically suspended shackle elements suspended at upper ends from the trolley system and having adjacent the lower extremities thereof retaining elements for interconnection of the suspended articles. In operation and functional structure, an abutment and/or deflection elements are fixedly mounted at a point or points in the course of travel of the shackles for striking against and preferably camming the shackles and particularly the retaining elements in such a way as to release the articles which then drop with the aid of gravity.

3,656,207
MOP HEAD HOLDER
Joe T. Short, West Point, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Filed May 13, 1970, Ser. No. 36,924
Int. Cl. A47l *13/252*
U.S. Cl. 15—147 B **3 Claims**

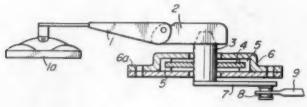
A mop head holder adapted for removable attachment to a

retaining clip of a mop handle and being particularly designed for the reception and support of a wet-type mop head.

3,656,208
WINDSHIELD WIPER

Masumi Kato, Aichi-gun, and Yoshiyuki Morita, Kariya-shi, both of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Dec. 23, 1969, Ser. No. 887,493
Claims priority, application Japan, Mar. 6, 1969, 44/17075; Dec. 25, 1968, 43/113946; Jan. 6, 1969, 44/1903
Int. Cl. B60s *1/34*
U.S. Cl. 15—250.31 **8 Claims**



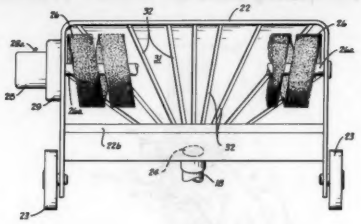
Improved construction of a windshield wiper in which a wiper arm is supported by a pivot shaft by means of an arm joint. The arm joint has an extension forming a driving lever integrally formed in the arm joint, the pivot shaft is provided with a disc-like bearing plate integral therewith and extending radially therefrom so that the bearing plate is supported at its outer peripheral portion. The wiper arm may comprise a sub-arm together with a main arm, and the sub-arm is formed with an arcuate slot at its hinged portion through which the pivot shaft passes. The size and configuration of the slot so determined that the position of the sub-arm can be freely selected without being restricted by the position of the pivot shaft of the main arm.

3,656,209
ETCHING ACID PICK-UP APPARATUS

Russell S. Kinser, R.R. 1, Monticello, Ind.

Filed Aug. 28, 1970, Ser. No. 67,698
Int. Cl. A47l *5/36*
U.S. Cl. 15—349 **1 Claim**

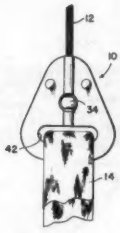
An apparatus adapted for retrieving etching fluid used in applying seamless floors, particularly a pick-up head having a power-rotated spiralled brush for throwing liquid upward from the surface over which the brush passes onto an overlying plate which is grooved to channel the liquid toward a central vacuum aperture in the pick-up head.



3,656,210
CABLE END FITTING

Robert W. Parker, Brawley, and Jacob H. McGary, El Centro, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Sept. 25, 1970, Ser. No. 75,511
Int. Cl. F16g *11/02*; **A44c** *5/18*
U.S. Cl. 24—123 A **4 Claims**

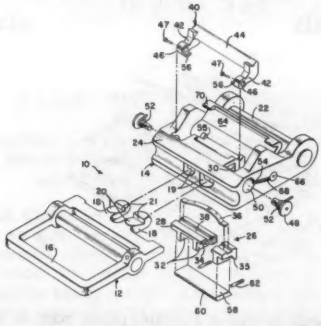


A cable end fitting that is fabricated from a single blank of sheet metal and stamped with a recess to receive and retain an enlarged end of the cable, the blank being intermediately bent so that its free ends are in lapping relationship, and means provided for fastening the lapped free ends together to capture and to secure the cable end therebetween.

3,656,211
RECIPROCABLY LATCHED CANOPY RELEASE

James W. Turner, and Ray E. Spinks, both of El Centro, Calif., assignors to The United States of America as represented by the Secretary of the Navy

Filed Apr. 28, 1970, Ser. No. 32,674
Int. Cl. A44b *19/00*
U.S. Cl. 24—230 **9 Claims**



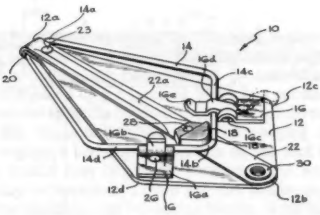
A parachute canopy release having a female fitting and a

male fitting having prongs to be positively latched within the female fitting, the latching means being preformed by a reciprocable latch bar to minimize inadvertent separation, the latch bar being cam operated by an actuating lever in a direction normal to a plane containing the prongs to release the prongs and allow the fittings to be separated.

3,656,212
UNIVERSAL CLAMP

Thomas H. Velte, 417 East 14th Street, Kaukauna, Wis.

Filed July 13, 1970, Ser. No. 54,492
Int. Cl. A44b *21/00*
U.S. Cl. 24—250 **11 Claims**

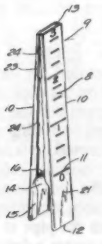


A universal clamp for securing flexible sheet-like material capable of being folded back upon itself includes a base plate disposable adjacent an edge or corner of the sheet-like material, a ring member pivotally mounted on the base plate for insertion into the folded portion of the sheet-like material, and spring clasps or the like mounted on the base plate for holding the portion of the sheet-like material in which the ring member is inserted against the base plate.

3,656,213
HEMMING CLIP

Fay C. McNeely, Route 2, Spencer, Wis.

Continuation of application Ser. No. 801,694, Feb. 24, 1969, now abandoned. This application Feb. 12, 1971, Ser. No. 115,003
Int. Cl. A44b *21/00*
U.S. Cl. 24—252 GC **10 Claims**

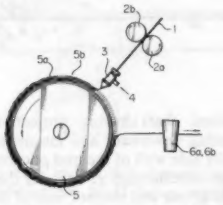


A hemming clip having a pair of elongated clamping leaves with a scale along at least one leaf which starts at a point spaced inwardly from one end of the clip and is aligned with a stop to automatically align the starting indicia of the scale with the hem fold when the clip is fully advanced on the hem. The leaves are pivotally interconnected and have a spring between the leaf lever arms. The space between the scale indicia bearing portion of the leaves is unobstructed to receive the hem.

3,656,214
CRIMPING APPARATUS FOR MANUFACTURING A BULKY YARN

Goro Ozaw; Kenzo Kosaka; Kiyoshi Adachi; Tsutomu Okaya, and Takeo Ariki, all of Nagoya-shi, Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan

Filed Jan. 22, 1970, Ser. No. 4,827
Claims priority, application Japan, Aug. 26, 1969, 44/67084
Int. Cl. D02g *1/16*
U.S. Cl. 28—1.4 **8 Claims**

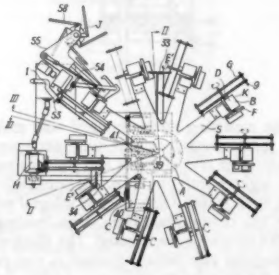


An air-jet type crimping apparatus equipped with a fiber ejection nozzle of an increased thermal effect, a rotational crimping member having a surface on which are peripherally arranged needle or honey-combed protuberances defining a multiplicity of spaces receptive of the fibers ejected by the nozzle composing the yarn and cone-type means for taking up the yarn from the surface at speeds automatically adjusted according to variations in the thermal shrinkability of the processed fibers. Fiber cooling means may advantageously be added for enhanced stability of the crimps imparted to the fibers.

3,656,215
AUTOMATIC REELING MACHINE

Naoichiro Tanno, Kyoto-fu, Japan, assignor to Shimadzu Seisakusho Ltd., Kyoto-fu, Japan

Filed Sept. 9, 1969, Ser. No. 862,621
Claims priority, application Japan, Mar. 15, 1969, 44/19719
Int. Cl. B65h *55/00*
U.S. Cl. 28—21 **33 Claims**



An automatic reeling machine constructed so as to automatically operate continuous steps of winding a certain amount of thread on each of several reels to form a hank thereon, of lacing a tie-band on said hank thus formed and of removing said laced hank from the reel, so that substantial automation of all manufacturing processes of the laced hank can be achieved. The laced hank manufactured by the automatic reeling machine of this invention contains a constant amount of thread without breakages and can be easily released of a knot positioned adjacent to the terminating end of the thread without entangling, so that an easy-to-handle hank of high quality can be obtained.

3,656,216

FILE HANDLE

James A. Coon, 929 Drever Street, W. Sacramento, Calif., and Elwin Theobald, 4631 Solano Way, Fair Oaks, Calif., assignors to said Coon, by said Theobald

Filed July 10, 1970, Ser. No. 53,889
Int. Cl. B23d *71/04*
U.S. Cl. 29—80 **6 Claims**

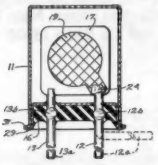
A longitudinal shaft having projections on each end thereof extending downward and inward toward each other for gripping the side wall of the end portions of a hollow file, a bolt inserted therethrough at one end thereof, a handle attached thereto at one end thereof, one of the projections and the handle having a longitudinal slot in which the bolt is inserted for adjustment of the handle and adjustment of the projection to grip the end of the file, and vertical extensions extending from both surfaces of the shaft to prevent unwanted side slippage and twisting of the adjustable handle and projection.

3,656,217

METHOD OF MAKING PIEZOELECTRIC CRYSTAL UNITS

Kelley E. Scott, Jr., Plano; Daryl M. Kemper, Sandwich, both of Ill.; Lloyd E. Grove, Geneva, and Ronald J. Kiess, Decatur, both of Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed June 6, 1969, Ser. No. 830,956
Int. Cl. B01j *17/00;* **H04r** *17/00*
U.S. Cl. 29—25.35 **6 Claims**



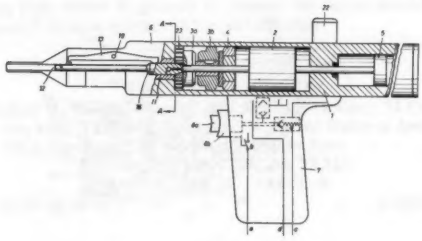
Crystal plate mounting means integral with malleable terminals of a piezoelectric crystal unit accommodate differently dimensioned crystal plates and permit spacing of the terminals for registry with circuit board perforations without stress-loading such plates. Other means integral with the terminals isolate the crystal plate from stress-loading when the free ends of the terminals are stressed. The illustrated mounting means comprise bifurcations formed in one end of each terminal and the illustrated other means comprise a paddle section of each terminal embedded in a resilient organic adhesive securing and hermetically sealing each terminal to an eyelet. The malleable terminals are solderable and readily deformable to secure registry between the free ends of the terminals and perforations in printed circuit boards. The organic sealant is compatible with the malleable terminal material and withstands stresses induced therein when the terminals are stressed and when the eyelet is cold welded to an envelope. The disclosed method includes the steps of securing a pair of terminals to an eyelet, adapting the ends of the terminals to support a crystal plate without stress-loading such crystal plate, securing a crystal plate in a stress free condition to the terminals, and cold welding the eyelet to an envelope by a cold weld processing step to avoid mass-loading the crystal plate.

3,656,218

WIRE STRIPPING AND WRAPPING GUN

Bruno Staiger, Erligheim; Siegfried Schlag, Wimsheim, and Walter Hartl, Winnenden, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 21, 1969, Ser. No. 851,847
Claims priority, application Germany, Aug. 30, 1968, P 17 90 044.6
Int. Cl. B21f *15/00*
U.S. Cl. 29—33 F **6 Claims**

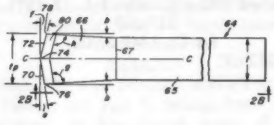


The driving mechanism for a wire stripping and wrapping tool is positioned along a central axis. Axial movement of a wrapper pin causes a knife to cut, strip and position the wire for wrapping. Different types of insulation can be accommodated.

3,656,219

CUTTING TOOL

Eugene B. Connelly, Churchill Borough, Pa., assignor to United States Steel Corporation

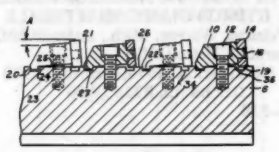
Filed Jan. 26, 1970, Ser. No. 5,750
Int. Cl. B26d *1/00;* **B23b** *5/11*
U.S. Cl. 29—95 **24 Claims**

A cutting tool is disclosed for an apparatus for cutting a crop section of pipe from the pipe at a predetermined location on the pipe. The apparatus has pipe mounting means for supporting the pipe, tool mounting means adjacent the pipe and drive means connected to one of the pipe and tool mounting means for causing relative rotary movement between the pipe and the tool mounting means. The cutting tool is mounted on the tool mounting means, is movable into cutting engagement with the pipe at the predetermined location, and is operable to create a deformed section of the pipe during the cutting operation. The cutting tool has a cutting tip provided with a pipe cutting edge and a crop cutting edge. The pipe cutting edge and the crop cutting edge intersect to form an apex. The pipe cutting edge defines with one side of the cutting tip of facing corner. The crop cutting edge defines, with the other side of the cutting tip, a crop corner. The crop corner is disposed a greater longitudinal distance from the apex than the facing corner so that the facing corner cuts through the pipe before the crop corner cuts through the crop section thereby permitting the deformed section to fall from the pipe with the crop section.

3,656,220

INDEXABLE BROACH

Hubert J. Dupuis, Warren, Mich., assignor to Carmet Company, Pittsburgh, Pa.

Filed Jan. 2, 1970, Ser. No. 176
Int. Cl. B26d 1/04, 1/12, 1/00
U.S. Cl. 29—95.1 9 Claims



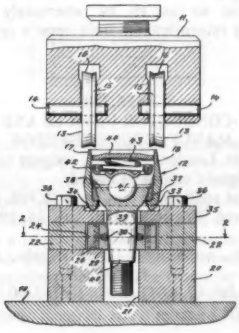
Apparatus for broaching planar or contoured surfaces with a broaching tool having a plurality of preferably indexable and reversible cutting inserts supported by individual tool holders superimposed on a broaching block in a substantially exposed relationship to the broaching block. In preferred embodiments the broaching block contains gauging means adapted to engage a cooperating portion of the tool holder whereby the holder may be rapidly positioned and forces of broaching may be transferred from the tool holder supporting the cutting inserts to the broaching blocks. A further embodiment includes the broaching block and tool holder adapted with a keyway to engage a complementarily shaped projection to enhance the rapid positioning of the mounting block and increase the locating force upon the insert which secures it in position.

3,656,221

METHOD OF ASSEMBLY OF JOINT DEVICES AND APPARATUS THEREFOR

William A. Scheublein, Jr., Ballwin, and Louis P. Fister, St. Louis, both of Mo., assignors to Moog Industries, Inc., St. Louis, Mo.

Filed Feb. 2, 1970, Ser. No. 7,514
Int. Cl. B23p 11/00; B21d 53/00, 39/00
U.S. Cl. 29—149.5 B 7 Claims



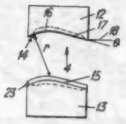
A method especially suitable for assembling joint devices for use as mechanical connections, such as ball joints, tie rod ends or idler arms, so as to eliminate internal clearance between components due to manufacturing tolerances and for the purpose of obtaining substantially precise assembly control whereby defects such as jamming and lock-up of the movable components may be avoided. The method is put into practice by relatively simple tools which collectively constitute an improved apparatus to achieve superior results in the economy of assembling joint devices of the noted character.

3,656,222

METHOD OF MAKING AN AEROFOIL-SHAPED BLADE OR BLADE BLANK

John Windsor Jones, Thornton-in-Craven, Skipton, England, assignor to Rolls-Royce Limited, Derby, Derbyshire, England

Filed Mar. 17, 1969, Ser. No. 807,586
Claims priority, application Great Britain, Mar. 27, 1968, 14,781/68
Int. Cl. B21k 3/04; B23p 15/02, 15/04
U.S. Cl. 29—156.8 H 7 Claims



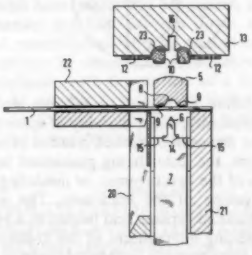
A method of making an aerofoil-shaped blade or blade blank comprises forming two blade halves which are assembled together to form the complete blade or blade blank. The surfaces of adjacent blade halves have cooling fluid passages therebetween, and in assembling the blade halves a sheet of brazing material is interposed between the blade halves. The sheet is provided with slots therein which are aligned with and of corresponding shape to the cooling fluid passages.

3,656,223

METHOD OF MAKING SLIDING-CLASP FASTENERS

Dieter Maisenbacher, Stuttgart-Hohenheim, Germany, assignor to Karl F. Nagele Feinmaschinenbau, Stuttgart-Hohenheim, Germany

Filed Sept. 17, 1970, Ser. No. 73,203
Claims priority, application Germany, Sept. 18, 1969, P 19 47 345.1
Int. Cl. B21d 53/50; B23p 11/00; B21d 53/50
U.S. Cl. 29—408 10 Claims



This invention relates to sliding-clasp fasteners and in particular to the positioning of the end stops thereon, particularly at the opening end of the fastener. In accordance with the invention, a pair of linked or otherwise integralised end stops is formed at the location of the said opening end of the fastener and is bent around for securing to the stringers and, after being mounted in position, is separated into two individual stops. During the operation of forming and separating the stops, the fastener is in the closed condition.

3,656,224

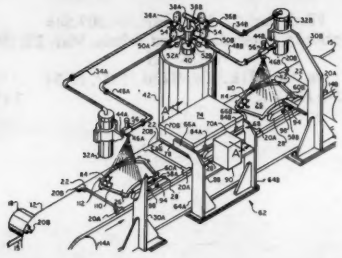
METHOD OF FORMING A HONEYCOMB CORE PANEL

Winford Blair, La Mesa, and Walter L. Bubel, Chula Vista, both of Calif., assignors to Rohr Corporation, Chula Vista, Calif.

Filed Apr. 9, 1969, Ser. No. 814,603
Int. Cl. B23k 31/02
U.S. Cl. 29—471.1 5 Claims

Face sheets are bonded to honeycomb core material by applying brazing material to a side surface of one of said face

sheets, placing one side of the honeycomb core material against the side of the aforesaid face sheet covered with brazing material and the other face sheet against the other side of the honeycomb core material, heating the assembly to melt

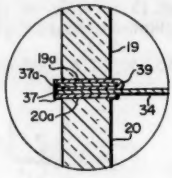


the brazing material, and thereafter permitting the assembly to cool. Capillary action causes flow of the brazing material from the face sheet initially covered therewith to the other face sheet when the brazing material is melted.

3,656,225
METHOD OF SEALING AND EVACUATING VACUUM ENVELOPES

Albert Bereza, Elmira, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1969, Ser. No. 862,401
Int. Cl. B23k *31/02*
U.S. Cl. 29—472.7 **4 Claims**



The two insulating casings of a vacuum envelope are placed in close proximity, and a plurality of spaced U-shaped brazing shims are disposed in spaced relation around an annular brazing shim, the latter being positioned between the confronting ends of the two ceramic, or insulating rings constituting the envelope of the enclosure. The envelope is placed within a vacuum furnace and heated to a temperature just below the melting temperature of the U-shaped brazing shims. In effect, this creates a peripheral opening permitting thereby a communicating passage between the interior and the exterior of the envelope for outgassing procedures.

When the desired degree of outgassing and evacuation has occurred, the temperature of the vacuum furnace is raised to the melting point of the plurality of spaced brazing shims, and they melt flowing into the space between the two ceramic or insulating casings, and sealing the same together. No tubulation is needed with this method.

3,656,226
BRAZING METAL SURFACES

Frederick A. Burne, Hamden, Conn., assignor to Olin Mathieson Chemical Corporation

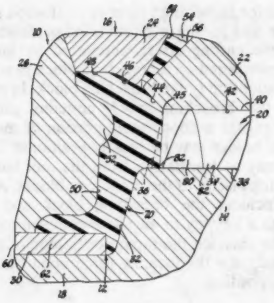
Original application July 5, 1968, Ser. No. 742,527, now Patent No. 3,589,952. Divided and this application June 12, 1970, Ser. No. 57,862
Int. Cl. B23k *35/12*
U.S. Cl. 29—502 **8 Claims**

An improved method for brazing cuprous or ferrous surfaces utilizing an admixture of brazing powder and certain hydroxy-containing organic compounds. The organic compounds provide an effective medium for adhering the brazing powder to a metallic surface and enable the preparation of a convenient, easy to use, brazing slurry.

3,656,227
METHOD OF MAKING A MOLD FOR BIDIRECTIONAL HYDRODYNAMIC SHAFT SEALS

Louis H. Weinand, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1970, Ser. No. 22,978
Int. Cl. B23p *17/00*
U.S. Cl. 29—530 **1 Claim**

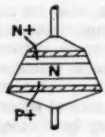


A method of making a mold for bidirectional hydrodynamic shaft seals wherein the mold face for forming the air side wall of the seal includes a plurality of circumferentially spaced, wedge-shaped recesses formed by a grinding wheel. The recesses are inclined with respect to the mold face and establish projecting cylindrical pads on the molded seal, the side walls of which have arcuate shapes and define triangular, grooved areas therebetween. The bases of the side walls operatively engage the shaft to be sealed in a trapezoidal contact pattern so as to be alternately effective to unidirectionally return leaking fluid upon a reversal of shaft rotation.

3,656,228
SEMI-CONDUCTOR DEVICES AND THE MANUFACTURE THEREOF

William B. Glass, London, England, assignor to Westinghouse Brake and Signal Company Limited

Continuation of application Ser. No. 688,395, Dec. 6, 1967, now abandoned. This application Aug. 25, 1970, Ser. No. 66,884
Claims priority, application Great Britain, Jan. 30, 1967, 4,382/67
Int. Cl. B01j *17/00*; **H01l** *5/00*
U.S. Cl. 29—578 **6 Claims**

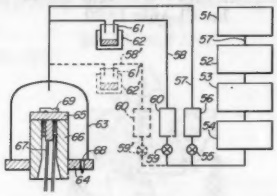


Unequal diameter pinheads, soldered to silicon chip, so that etch produces chamfered diode.

3,656,229
PROCESS FOR PRODUCING MAGNETIC HEAD

Yo Sakurai, Kunitachi-shi; Teizo Tamura, Katsuta-shi, and Norikazu Hashimoto, Hachioji-shi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1969, Ser. No. 874,292
Claims priority, application Japan, Nov. 8, 1968, 43/81256; Feb. 28, 1969, 44/14621
Int. Cl. G11b 5/42; H01f 7/06
U.S. Cl. 29—603 8 Claims

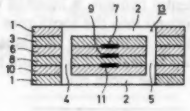


An improved magnetic head is produced by utilizing as a spacer for regulating the width of the head gap thereof a non-magnetic oxide film formed by applying a vapor of at least one volatile metal alkoxide capable of forming a non-magnetic metal oxide by thermal decomposition reaction, e.g. an alkoxide of such a metal as Al, Ti, Zr, Si or Hf, onto the surface of a ferrite core heated to above the thermal decomposition temperature of said alkoxide, thereby bringing about on the core surface the thermal decomposition reaction of said alkoxide.

3,656,230
METHOD OF MANUFACTURING MAGNETIC STORAGE ELEMENTS

Heimo Hardung-Hardung, Frankfurt am Main, Germany, assignor to Vickers-Zimmer Aktiengeselschaft Planung und Bau von Industrieanlagen

Filed July 31, 1969, Ser. No. 846,332
Claims priority, application Germany, Aug. 9, 1968, P 17 64 812.3
Int. Cl. H01f 7/06
U.S. Cl. 29—604 2 Claims



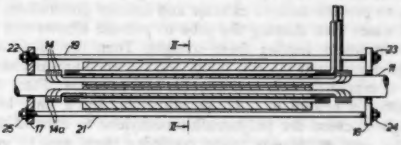
A process for the manufacture of a magnetic storage element useful in data processing apparatus. Said element is made by stacking a plurality of plates, made of a non-magnetic, and electrically insulating material, each of which has openings therein so that the openings of the stacked plates together form a recess for receiving a magnetic core. Some of the stacked plates have electrical conductors formed thereon by a printing method. The magnetic core is formed in situ in the stacked plates by solidifying a fluid mixture containing a magnetic material and a resinous binder within the recess.

3,656,231
METHOD OF INSULATING ELECTRICAL CONDUCTORS

Robert Sheldon, Abingdon, and Geoffrey Brian Stapleton, Wantage, both of England, assignors to Science Research Council, London, England

Filed June 9, 1969, Ser. No. 831,306
Claims priority, application Great Britain, June 12, 1968, 28,048/68; Jan. 31, 1969, 5,502/69
Int. Cl. H01b 13/00; H05k 3/00
U.S. Cl. 29—624 7 Claims

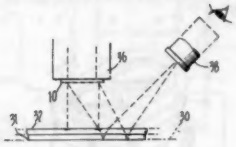
In electrical apparatus subject to nuclear radiation, electrical conductors, in particular for the magnet coils of an accelerator, are mechanically supported and electrically insulated from one another by concrete held under permanent compressive stress.



3,656,232
METHOD OF ENCAPSULATING COPLANAR MICROELECTRIC SYSTEM

John F. Hinchey, Contra Costa, Calif., assignor to The Singer Company

Original application May 15, 1967, Ser. No. 638,536, now Patent No. 3,489,952, dated Jan. 13, 1970. Divided and this application May 28, 1969, Ser. No. 847,762
Int. Cl. H01b 68/02
U.S. Cl. 29—624 8 Claims

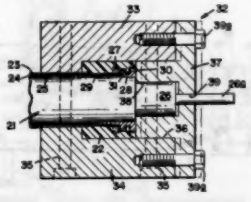


Microelectronic units such as integrated-circuit chips equipped with heat-conducting extensions, and also terminal pins, are sealed and bonded, face down, on a transparent mold board, precisely located with respect to gauge marks on the upper surface by observation from below, and embedded flush, or coplanar, with the surface of a cast encapsulating block such as ceramic or epoxy. Insulating interconnecting conductors are formed on the coplanar surface of said block and embedded microelectronic units.

3,656,233
MAKING POLYTETRAFLUOROETHYLENE ARTICLES INCLUDING TUBES, AND FITTINGS EMPLOYING SUCH TUBES, HAVING IMPROVED CONCENTRICITY AND DIMENSIONAL STABILITY

John S. Overholser, Klamath, Calif., assignor to Dynalectron Corporation, Washington, D.C.

Continuation-in-part of application Ser. No. 577,381, Sept. 6, 1966, now abandoned. This application Nov. 19, 1968, Ser. No. 776,909
Int. Cl. H02g 15/00
U.S. Cl. 29—629 15 Claims



Starting from high quality, dense, and relatively dimen-

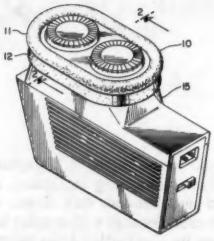
sionally stable rods of polytetrafluoroethylene, the invention provides articles including tubes and fittings incorporating such tubes having very accurate concentricity and improved dimensional stability by: first machining and drilling the rod stock to provide desired exterior and interior dimensions, in some cases then shaping the tube to provide elbows and in other instances leaving them straight. Then the tubes are confined and their interior filled, and the ends are mechanically compressed with considerable end pressure. Then the assembly is heated to a temperature and for a time long enough to cause the polytetrafluoroethylene to expand and fill the very accurately made confining parts and to grip tightly the filling part, which is also very accurately made, allowing time enough at such temperature to obliterate the memory of former configurations of the polytetrafluoroethylene and thereby relieve the stresses incurred by previous manufacture and by the compressing. Then the assembly is cooled and the compressing parts removed. The finished part cannot thereafter shrink endwise and it retains its dimensions and concentricity.

3,656,234

EMOLLIENT APPLICATOR FOR USE WITH ELECTRIC SHAVERS

Malachy J. Regan, 1911 Jefferson Davis Highway, Room 302, Arlington, Va.

Filed July 1, 1970, Ser. No. 51,539
Int. Cl. B26b *21/44*
U.S. Cl. 30—90 **3 Claims**



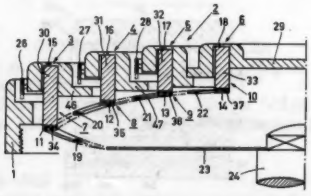
This disclosure relates to an applicator elastically applied upon the head of an electric shaving device and having integral means for the absorptive containment of an emollient which is applied upon the skin by pressure of the applicator thereon. Such emollient thereby conditions the skin and beard for removal of the latter by the cutting heads of the electric shaver.

3,656,235

SHAVING-HEAD ASSEMBLY

Frans Zuurveen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 29, 1970, Ser. No. 50,824
Claims priority, application Netherlands, July 4, 1969, 6910273
Int. Cl. B26b *19/04*
U.S. Cl. 30—346.51 **9 Claims**



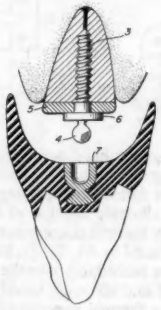
A shaving-head assembly which is actuated by one drive shaft, with shear plates that are capable of having their angular positions varied relative to the drive shaft by the use of gimbal rings from which these shear plates are suspended. Spring biased cutters cooperatively engage with the shear plates to cut facial hair.

3,656,236

DENTURE RETENTION METHOD

Peter F. Kurer, 39 Deansgate, Cheadle, England

Filed Oct. 16, 1970, Ser. No. 81,394
Int. Cl. A61c *13/00*
U.S. Cl. 32—2 **2 Claims**



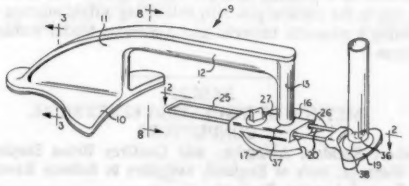
A dental procedure for providing a secure anchor in the mouth to which a denture can be attached utilizes a temporary post having a threaded shank carrying a cylindrical head. A natural tooth root is drilled and tapped to form a threaded hole in which the shank of the temporary post is received. An impression is taken of the face of the tooth root and the protruding head of the temporary post. The temporary post is removed and a cap, prepared from the impression and having a hole in it where the head projection occurred, is secured to the tooth root. A permanent post is then utilized which has its head in the form of a denture retainer atop a threaded shank. The threaded shank of the permanent post, after being coated with dental cement, is inserted through the hole in the cap and is screwed into the tooth root. With the shank fully inserted, the head of the post overlaps the hole in the cap. sits upon the cap to seal that hole, and aids in maintaining the cap in place on the tooth root.

3,656,237

LEAD HOLDER DRAFTING COMPASS

Thomas O. Killgrove, P.O. Box 395, Frazier Park, Calif.

Filed Nov. 18, 1970, Ser. No. 90,757
Int. Cl. B43l *9/02*
U.S. Cl. 33—27 D **5 Claims**



A frame held drafting compass for drawing circles wherein the compass pivot is located at the center of the circle to be drawn and the base of the frame contacts the drawing surface outside of the circle to be drawn, so that a contact point at

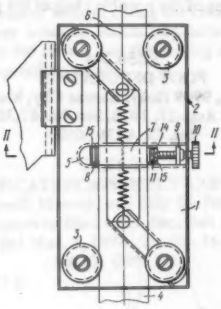
the center of the circle to be drawn is unnecessary. The scribing structure includes a lead holder adjustable so that the angle of incidence of the lead to the paper can be varied.

3,656,238

LOCKING DEVICE FOR THE CARRIAGE OF A DRAWING APPARATUS

Evgeny Mikhailovich Perminov, ulitsa Angarskaya, 26 Korpus I, kv. 10, Minsk, U.S.S.R.

Filed July 22, 1970, Ser. No. 57,129
Claims priority, application U.S.S.R., Aug. 14, 1969, 1358220
Int. Cl. B43l *13/02*
U.S. Cl. 33—76 R **1 Claim**



A locking device for the carriage of a drawing apparatus, in which the base of the carriage has a groove therein, extending laterally with respect of the longitudinal axis of the base, with the groove receiving a slide. The slide has its opposite end portions bent in the same direction, with one of the opposite end portions acting as a stop adapted to engage a guideway along which the carriage is adapted to travel. Mounted intermediate of the bottom of the groove and slide is a bent leaf spring having first end portion thereof secured to the slide and a second end portion thereof extending through an opening in the slide and acting as another stop, also adapted to engage the guideway.

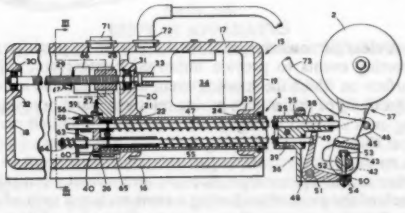
The other one of the opposite end portions of the slide supports means for selectively clamping the guideway between two stops, and such means is associated with the second end portion of the spring.

3,656,239

MEASURING APPARATUS

Desmond Ernest Hutchinson, and John David Bickerdike, both of Bradford, England, assignors to The English Electric Company Limited, London, England

Filed Apr. 7, 1969, Ser. No. 813,966
Claims priority, application Great Britain, Apr. 9, 1968, 17,066/68
Int. Cl. G01b *3/12, 7/04*
U.S. Cl. 33—141 R **6 Claims**



Apparatus for measuring the diameter of a workpiece includes a wheel which is rotated by contact with the workpiece and drives a pulse generator. The number of pulses generated during each revolution is counted and gives a direct indication of the workpiece diameter.

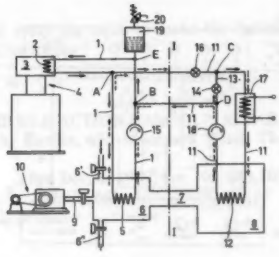
The wheel is positioned by a unit which automatically sets the pressure of the wheel against the workpiece and retracts the wheel if any of a number of fault conditions occurs such as the feeding of the wheel against the side of a shoulder on the workpiece; reaching the limit of travel of the wheel without having reached the workpiece; over-pressure on the wheel caused, for example, by swarf between the wheel and the workpiece; and excessive forward movement of the wheel.

3,656,240

FREEZE-DRYER

Nicolaas Antonie Van Dijk, Van Houtenlaan, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 18, 1970, Ser. No. 37,975
Claims priority, application Netherlands, May 30, 1969, 6908334
Int. Cl. F26b *13/30*
U.S. Cl. 34—92 **3 Claims**



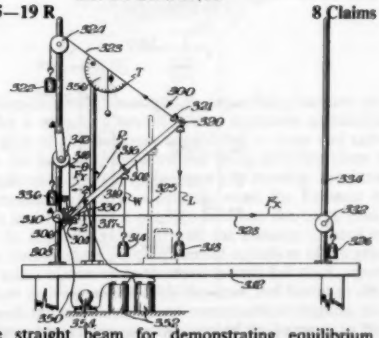
The invention provides a freeze-dryer of a simple construction in which the freeze-drying temperature of the vacuum chamber and the temperature of the condenser chamber which is at a lower level are adjusted by means of a liquid conducted along the cold head of a cold-gas refrigerator. This liquid is also advantageously used for defrosting the ice mass formed in the condenser chamber in a very short period of time, after the freeze-drying process.

3,656,241

EXPERIMENTAL DERRICK AND LADDER ASSEMBLY

Robert F. Chambers, 504 Beverly Road, Newark, Del.

Continuation-in-part of application Ser. No. 735,259, June 7, 1968, now Patent No. 3,520,981. This application Apr. 21, 1970, Ser. No. 30,449
Int. Cl. G09b *23/08*
U.S. Cl. 35—19 R **8 Claims**



Elongate straight beam for demonstrating equilibrium phenomena in classroom physics instruction includes bearing

members rotatably mounted at beam ends by pins transversely disposed relative to longitudinal centerline of beam. Lugs rotatably secured to pins at longitudinal centerline of beam have openings for attaching coplanar forces to beam.

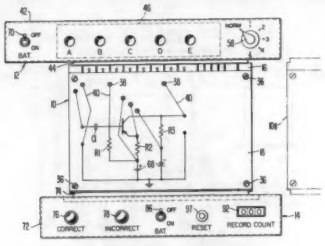
Elongate straight beam is used as experimental derrick and experimental ladder. Primary objective of derrick experiment is to determine magnitude and direction of reaction force lower support exerts against beam under equilibrium conditions. Magnitude and direction of reaction force found experimentally are compared with theoretically determined values. Primary objective in ladder experiment is to determine magnitude and direction of force lower support exerts against beam under equilibrium conditions. Also, magnitude of force upper support exerts against beam is determined. Experimental values are then compared with theoretical values.

3,656,242

ELECTRONIC CIRCUITS INSTRUCTIONAL APPARATUS

Robert J. Atkinson, Philadelphia, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 16, 1970, Ser. No. 19,826
Int. Cl. G09b *23/18, 7/06*
U.S. Cl. 35—19 A **10 Claims**



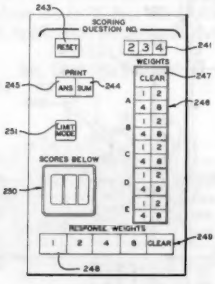
A teaching apparatus which permits construction and testing of a number of different electronic circuits with a single set of electronic components, such as resistors, capacitors, transistors, etc. Problems can be inserted into the apparatus, in which case the correctness of answers to the problems is indicated and the number of incorrect answers is recorded.

3,656,243

RESPONSE SYSTEM WITH IMPROVED COMPUTATIONAL METHODS AND APPARATUS

Bernard M. Segal, Binghamton, N.Y., and David Friedman, Framingham, Mass., assignors to The Singer Company, New York, N.Y.

Filed Aug. 10, 1970, Ser. No. 62,382
Int. Cl. G09b
U.S. Cl. 35—48 B **4 Claims**



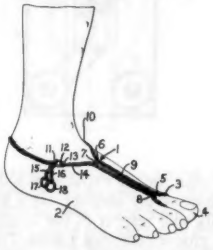
An improved classroom response system of the type wherein a number of students are provided with individual responders each having a plurality of switches selectively operable to indicate the student's choice of response to a question or other stimulus. The invention is directed to novel methods and apparatus for performing arithmetic operations and displays which make available to the instructor information helpful in conducting the class and otherwise simplify instructional tasks. Included are means for automatically indicating which of several responses is "correct" by determining the response to which the highest weight has been assigned by the instructor. Also disclosed are novel means to calculate each individual student's cumulative score and to indicate automatically the students whose scores fall below a preselected acceptable percentage of the maximum possible score. Displays of the total number of students responding to a given question, and the percent of the class which has responded with any of the possible choices are provided.

3,656,244

FOOT DECORATION

Mary L. Andrade, 9909 Holly, Kansas City, Mo.

Filed Aug. 27, 1970, Ser. No. 67,353
Int. Cl. A43b *00/00*
U.S. Cl. 36—1 **2 Claims**



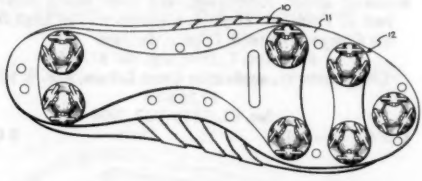
This invention discloses a decoration for the foot or feet of a person when going barefooted, and consists of a loop portion to engage over the toe of the user and a decorative piece between the toe and the ankle with means, such as a cord or the like, for engaging around the ankle.

3,656,245

ATHLETIC SHOE CLEAT

Henry H. Wilson, 533 View Park Drive, Knoxville, Tenn.

Filed Sept. 8, 1970, Ser. No. 70,347
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 D **11 Claims**



A cleat particularly useful for shoes worn by participants in sporting events to provide improved engagement with the surface on which the sporting event takes place and including a grouping of projections having relatively blunt nonpenetrating ends adapted to engage the surface with limited penetration thereof, such grouping including a plurality of projections disposed in spaced-apart relation with respect to each other and in a generally concentric array about a central axis, each of the projections having a cross sectional area which is small with respect to the transverse dimension of its respective grouping.

3,656,246

METHOD OF MAKING A DURABLE PRESS GARMENT WHICH MAY BE CONDUCTED IN THE HOME

John Garvin Lord, Swarthmore, Pa., assignor to Mechanical Product Development Corp., Norwood, Pa.

Filed May 20, 1969, Ser. No. 826,277
Int. Cl. D06m *13/54, 13/40*
U.S. Cl. 38—144 8 Claims

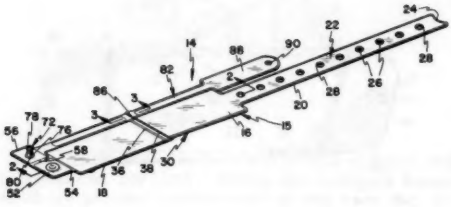
A durable press garment is made by cutting and assembling the garment from a cellulose fiber-containing fabric, pressing the garment to impart suitable creases thereto, supporting the garment on a form which maintains the garment's shape while spraying a liquid containing an uncured creaseproofing agent on the garment, drying the impregnated garment while on the form under normal atmospheric conditions, repressing the garment without curing the creaseproofing agent to eliminate any wrinkles which may have formed therein and to touch up the crease, and the heating of the garment to cure the creaseproofing agent.

3,656,247

IDENTIFICATION ASSEMBLY AND METHOD

Dwitht J. Bushnell, Murray, and Billy M. Jensen, Sandy, both of Utah, assignors to Bio-Logics, Inc., Salt Lake City, Utah

Filed Mar. 5, 1970, Ser. No. 16,886
Int. Cl. G09f *3/14*
U.S. Cl. 40—21 C 8 Claims



A unitary identification assembly and method, the assembly comprising a band having a pocket at the exposed surface for receiving and storing an encoded identification plate and a lower pocket for receiving a visually readable identification card, the band being eccentrically connected at one end to a tether across a fold line. The tether is looped through a slot in the identification plate and a single male-female fastener mechanism unites the tether to itself and the identification band to itself in overlapping relation with the tether folded out of the eccentric position upon the identification band when in use.

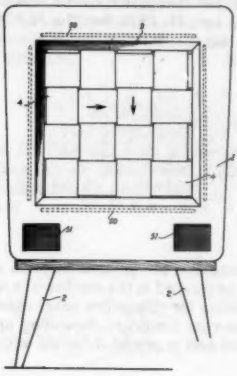
3,656,248

DISPLAY APPARATUS

Otto H. Echter, Apt. 1509, Plieningerstrasse 100, Stuttgart 80, Germany

Filed May 15, 1970, Ser. No. 37,760
Claims priority, application Ireland, June 18, 1969, 836/69
Int. Cl. G09f *11/26*
U.S. Cl. 40—32 12 Claims

A visual display device having at least two pairs of spaced opposed rollers. One pair of rollers is mounted horizontally in a vertical plane. The other pair of rollers is mounted vertically in the same plane. Each pair of rollers is provided with a plurality of tapes on which visual indicia are carried. The tapes of the horizontal rollers are interwoven with the tape of the vertical rollers. Drive means is also provided to rotate the



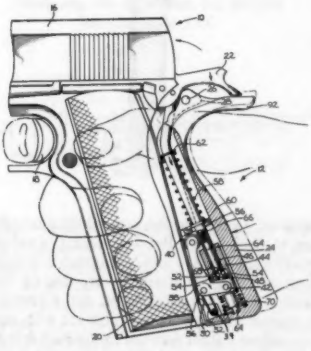
rollers and move the tapes to make the indicia periodically visible and invisible.

3,656,249

DOUBLE ACTION HANDGUN APPARATUS

Clarence A. Raville, 650 Moorpark Road, Thousand Oaks, Calif.

Filed Dec. 8, 1969, Ser. No. 883,100
Int. Cl. F41c *5/00, 19/00, 19/14*
U.S. Cl. 42—69 B 24 Claims



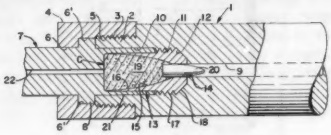
In combination with a handgun having a firing hammer actuatable by a trigger, a double action apparatus associated with the grip of the handgun comprising, a draw rod connected to the hammer, the draw rod being movable when a manual squeezing force is applied to a grip housing, the draw rod is movable by the grip housing when the hammer is located in an intermediate position between the firing position and the full cock position, with the hammer located in the above intermediate position manual actuation of the grip housing causes the hammer to move toward full cock, upon the hammer arriving at full cock the draw rod becomes disengaged with the grip housing and nonactuatable thereby, actuation of the trigger causes movement of the hammer to the firing position.

3,656,250

BREECH MECHANISM WITH INTERCHANGEABLE CHAMBER INSERTS FOR CASELESS AND CASE-TYPE CARTRIDGES

Daniel M. Brown, 806 Hampshire, Grand Prairie, Tex.

Filed Apr. 21, 1970, Ser. No. 30,438
Int. Cl. F41c *21/12, 11/00*
U.S. Cl. 42—76 R **7 Claims**



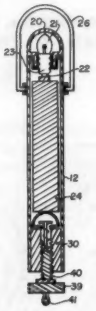
A breech mechanism for firearms includes a chamber insert adapted to be secured in the camber of a rifle or the like for easily converting the rifle to fire either caseless cartridges or standard case-type cartridges depending upon the insert used. A modified bolt is provided for use with the chamber insert.

3,656,251

FISH CATCH INDICATOR

Albert L. Snider, 1601 Corona, Austin, Tex., and Charles V. Jaecks, 612 East Virginia Drive, Round Rock, Tex.

Filed Nov. 10, 1969, Ser. No. 875,452
Int. Cl. A01k *97/12, 93/00*
U.S. Cl. 43—17 **8 Claims**



An improved electronic fish catch indicator adapted to be connected to fisherman's line comprising a tubular housing for a battery cell, a lamp, and a removable switch assembly. The switch assembly includes an arc-shaped flexible electrode, fixed switch contact surfaces, and a contact electrode movable against spring bias into contact with the fixed surfaces by a pull on a stem secured to the movable electrode to close the electrical circuit. A fishing line with a hook thereon is secured to the end of the stem extending outwardly of the housing and a pull on the line by a fish will actuate the switch to close the circuit and light the lamp. The switch assembly provided with a variable sensitivity control means for the spring biasing the movable electrode.

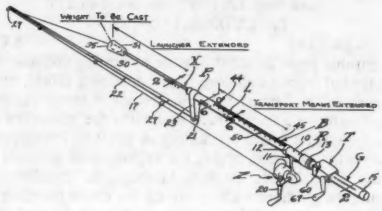
3,656,252

CASTING ROD

Samuel S. Sherman, 2893 Knox Avenue South, Minneapolis, Minn.

Filed Aug. 24, 1970, Ser. No. 66,213
Int. Cl. A01k *91/02*
U.S. Cl. 43—19 **25 Claims**

A fishing pole and casting mechanism adapted to throw a lure, bait, float or sinker with the fishing line attached thereto and comprising a spring gun incorporated in the handle of the pole which mounts a conventional casting reel; the invention being characterized by the extension of the conventional fishing rod in alignment with the casting reel and by the provision of selectively adjustable cocking means that tensions the spring gun for the desired distance of casting and which is predetermined according to the weight being cast.

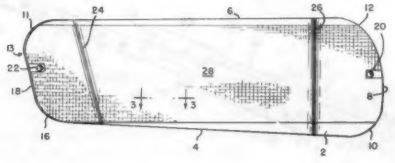


3,656,253

FISHING LURE FLASHER

Jack R. Gaunt, 1150 Tattershall Drive, Victoria, British Columbia, Canada

Filed Apr. 15, 1970, Ser. No. 28,577
Int. Cl. A01k *85/00, 85/04*
U.S. Cl. 43—42.33 **4 Claims**



A flasher for use in conjunction with a lure and a hook to catch fish including a base member of a relatively flat, elongated, stiff sheet plastic member having irregularly curved end portions and non-parallel side portions. A portion of each face of the base member is covered by a reflective strip. The base member is provided with an attaching hole at each end disposed along a line passing generally through the longitudinal center of the base member. The end portions of the base member are bent in opposite directions with one of the bends being approximately perpendicular to the said line between the said holes while the other bend is at a small acute angle thereto. The conformation of the flasher is such that when towed through the water, it will spin in large loops at a uniform speed, first in one direction and then in the other, producing an irregular reflective pattern attractive to fish.

3,656,254

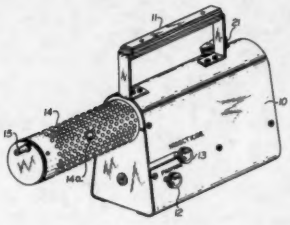
INSECTICIDAL JET FOGGER

Robert Schmedes, Rochester, and John M. Nelson, Webster, both of N.Y., assignors to Bernzomatic Corporation

Filed Sept. 15, 1969, Ser. No. 857,984
Int. Cl. A01m *7/00*
U.S. Cl. 43—129 **3 Claims**

A hand held and operated jet fogging device comprises a carrier or housing holding a tank for the insecticidal oil and a L. P. gas cartridge. The housing has on its upper portion a

carrying handle aligned with the axis of the housing. A cylindrical guard extends from the housing in alignment with the



axis of the housing and contains a burner, vaporizing coil and jet nozzle.

3,656,255

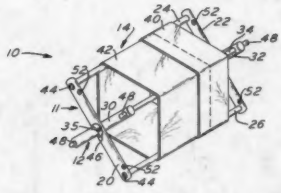
COLLAPSIBLE BLOCK HAVING PIVOTED FRAME AND ELASTIC WEB

Michael Rosenfeld, 371 Harvard Street, Cambridge, Mass.

Filed June 18, 1970, Ser. No. 47,508

Int. Cl. A63h *33/08*

U.S. Cl. 46—25 **5 Claims**



A collapsible block can be moved between collapsed and open positions. The block comprises two rectangular frames which are pivotally interconnected so that when they are swung into their open position, the frame has the configuration of an "X." At least one band of resilient material is wrapped around the frames. The band offers resistence as the block is moved from its collapsed position to its open position. However, once the block is open, the band assists in keeping it in that position.

3,656,256

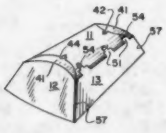
ROCKING CRADLE

Richard N. Maskell, Downers Grove; William C. Merrick, Carol Stream, and Fred P. Voges, Park Ridge, all of Ill., assignors to Container Corporation of America, Chicago, Ill.

Filed May 22, 1970, Ser. No. 39,831

Int. Cl. A63h *33/00*

U.S. Cl. 46—1 L **5 Claims**



A rocking cradle is formed from a cut and scored blank of paperboard or the like. It is formed from foldably interconnected top, side and bottom panels. Both the top and bottom panels have extensions therefrom foldably connected along curved score lines, so that both the top and bottom panels, when folded and connected to define a tube, are curved in transverse cross-section. The top panel is cut and scored and foldable to position to define inner sides of the finished cradle, and extensions from the bottom panel define inner ends for the cradle. The cradle is characterized by the top panel providing end and side rails providing good structural integrity to the total structure.

3,656,257

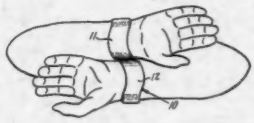
TOY SHACKLES

Marion H. Hill, 2621 Athens Court, Sacramento, Calif.

Filed July 28, 1970, Ser. No. 58,769

Int. Cl. A63h *33/00*

U.S. Cl. 46—1 R **1 Claim**



A pair of U-shaped spring bands pivoted together with a longitudinal pivot and connected by a chain along one side. The spring bands engage the crossed wrists of the user causing him to use his hands oppositely from normal when performing such things as bouncing and catching a ball, catching a ballon, lacing and tieing shoes, writing names, folding and ripping paper, threading needles, and the like.

3,656,258

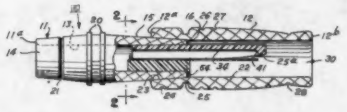
GAME CALL WITH VOICE ASSEMBLY HAVING POSITIONING MEANS THEREFOR

Dwight E. Thomas, Winsboro, Tex., assignor to Thomas Game Call Co., Inc., Winsboro, Tex.

Filed Aug. 10, 1970, Ser. No. 62,331

Int. Cl. A63h *5/00*

U.S. Cl. 46—180 **7 Claims**



A game call for simulating sounds of game, particularly fowl such as ducks, crows and the like, including a voice assembly having a vibrating reed held by a reed holder and a voice trough in a voice assembly holder provided with a mouth piece. The voice assembly has stop pins for positioning the reed and voice trough and a flange for positioning the voice assembly relative to the voice assembly holder. The operator blows air through the mouthpiece vibrating the reed generating a simulated game sound which is emitted through the voice assembly holder.

3,656,259

WINDOW GUIDANCE SYSTEM FOR THE SLIDING WINDOW OF A MOTOR VEHICLE

Karl Stark, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Mar. 9, 1970, Ser. No. 17,608

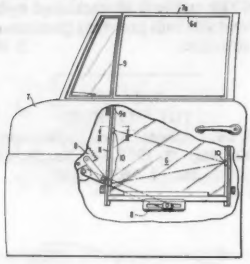
Claims priority, application Germany, Mar. 8, 1969, P 19 11 843.5

Int. Cl. E05d *15/16*

U.S. Cl. 49—440 **8 Claims**

Window guide for the sliding windows of a motor vehicle, characterized in that the lateral guide rails making up the

guide frame of the window terminate at about the height of the belt line of the car body, that is at the door locks, and at least two guide bodies of synthetic material provided with



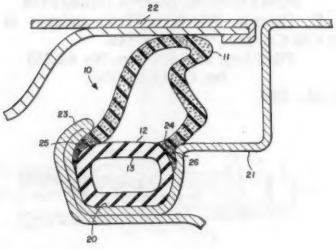
hollow opposed cheeks are fastened to a mounting rail arranged stationary in the window pit at one side of the window and at least a corresponding guide body is fastened to a mounting at the other side of the window.

3,656,260

CHANNEL HELD WEATHER SEAL

John L. Weaver, Rochester, and Edward H. Smoot, Holcombe, both of N.Y., assignors to The Schlegel Manufacturing Company, Rochester, N.Y.

Filed Oct. 26, 1970, Ser. No. 84,063
Int. Cl. E06b 7/23
U.S. Cl. 49—489 **5 Claims**



A weather seal to be secured in place in a channel has a relatively resilient, compressible, and soft sealing arm extending out beyond the open side of the channel for sealing purposes, and extending into the channel under an inturned lip along the open side of the channel. A firm and resilient base integral with the sealing arm is forcibly deformed to fit into the channel, and is stressed by the channel to compress the soft material tightly against the under side of the inturned lip to seal the soft material to the channel.

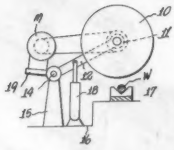
3,656,261

CUTTING DEVICE CONTROL

Charles T. Everett, Warren, Ohio, assignor to Everett Industries Incorporated, Warren, Ohio

Filed Aug. 28, 1970, Ser. No. 67,807
Int. Cl. B24b 1/00, 51/00, 47/06
U.S. Cl. 51—99 **10 Claims**

The invention relates to methods of and apparatus for controlling relative movement between a cutting device and an object to be cut and is particularly useful to regulate movement of an abrasive cut-off disc to compensate for wear of the disc. The invention utilizes the known fact that the drive motor for the disc requires less power when the disc is out of contact with the work than when the disc is actually cutting the work. An electrical control circuit is responsive to the



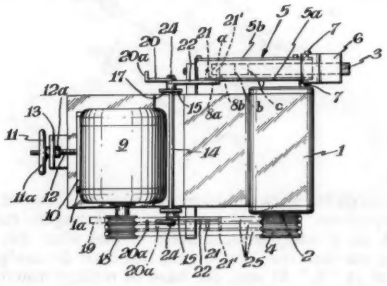
amount of power drawn by the motor, to return the cutting disc to its non-cut position immediately after the disc has cut through the work.

3,656,262

APPARATUS FOR PREVENTING CIRCUMFERENTIAL OVERSPEEDING OF GRINDING WHEELS

Makoto Kikuchi, and Kikuziro Nomura, both of Kariya, Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed June 17, 1970, Ser. No. 46,847
Claims priority, application Japan, June 21, 1969, 44/58747
Int. Cl. B24b 47/18
U.S. Cl. 51—134.5 R **3 Claims**



Apparatus for preventing circumferential overspeeding of grinding wheel comprises spindle with wheel connected thereto and motor assembly connected to spindle for rotating wheel. Motor assembly includes small diameter pulley for rotating large diameter grinding wheel. Assembly also includes alternate large diameter pulley for rotating worn substantially less than large diameter grinding wheel. Movable linkage is located between periphery of grinding wheel and periphery of pulley connected to rotate wheel. Linkage prevents replacement of worn wheel with new large diameter wheel when large diameter pulley is connected to rotate wheel since large diameter pulley operates to position movable linkage at location which is to be occupied by new large diameter wheel.

3,656,263

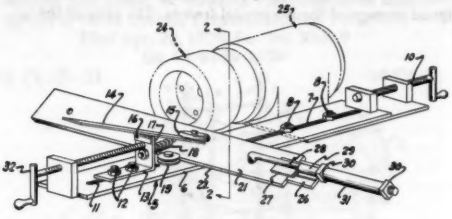
ATTACHMENT FOR HOLDING A FORAGE KNIFE ON A GRINDING MACHINE

Julius A. Jacobsen, 526 East 6th Street, Sioux Falls, S. Dak.

Filed June 18, 1970, Ser. No. 47,184
Int. Cl. B24b 41/06
U.S. Cl. 51—238 R **2 Claims**

This invention consists of a horizontally disposed rectangular supporting plate that is suitably secured to a grinding machine having a horizontally disposed cupped grinding wheel rotated by an electric motor, the aforesaid plate having

an L-shaped lever bracket adjustably secured thereto, the said bracket having a spring-loaded pressure lever hingedly

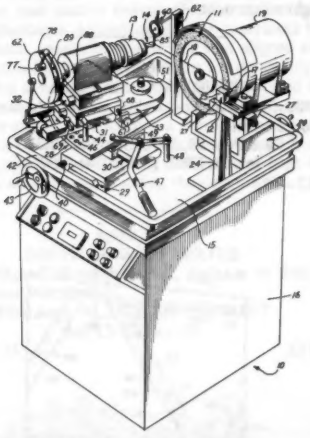


secured thereto; and wheeled means of supporting and holding a forage knife while the said knife is being sharpened by the said cupped grinding wheel.

3,656,264
METHOD OF GRINDING DRILLS

Bruce Alexander Mackey, Jr., Libertyville, and Edward Martin Naureckas, Gurnee, both of Ill., assignors to Radial Lip Machine Inc.

Original application Feb. 14, 1968, Ser. No. 705,393, now Patent No. 3,521,405, dated July 21, 1970. Divided and this application Apr. 24, 1970, Ser. No. 31,642
Int. Cl. B24b *1/00*
U.S. Cl. 51—288 **6 Claims**



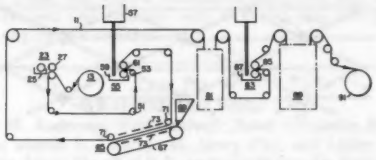
A method of grinding a drill with arcuate cutting lips comprising supporting the drill relative to a predetermined reference line, pivotally swinging the drill about a pivot point in the horizontal plane of said reference line, rotating the drill as it is being swung about the pivot point to maintain the cutting edge of the drill aligned with the reference line and in engagement with the flat grinding surface that is disposed parallel to and at an angle from the vertical plane of the reference line.

3,656,265
METHOD OF MAKING AN ABRASIVE BELT

Gus J. Schaffner, Jr., Pittsburgh, Pa., assignor to Schaffner Manufacturing Company, Inc., Pittsburgh, Pa.

Filed Oct. 14, 1969, Ser. No. 866,283
Int. Cl. B24b *1/00*
U.S. Cl. 51—295 **1 Claim**

There is disclosed a coated abrasive belt (17, FIG. 4) whose abrasive-particle grit-size, and/or backing material and/or adhesive can be determined by a supervisor or the user while the belt is in use from a color pattern (33, 35) on the belt. The pattern may consist of bands (33, 35) of one or more colors along the non-abrasive back of the belt. It may

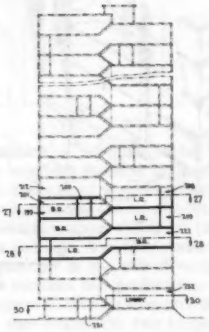


also include a colored abrasive surface (75, FIG. 5) produced by depositing, during the making of the belt, on the abrasive surface a colored adhesive and/or abrasive particles mixed with a coloring material.

3,656,266
BUILDINGS

Adolfo Tyllus, Washington, D.C., assignor to Alvic Development Corporation, Washington, D.C.

Filed May 7, 1970, Ser. No. 35,484
Int. Cl. E04f *11/00*, *17/04*
U.S. Cl. 52—30 **22 Claims**



Townhouse and multi-level buildings are formed by a relatively small number of precast, concrete elements, all of which, except those associated with staircases, are planar. Each building is divided into three sections; two sections are inhabitable while the third section forms a stairwell between the two inhabitable sections. Vertically adjacent inhabitable sections are displaced from each other by one half a story. The stairwell section includes a wall of a vent shaft for plumbing, electrical and heating conduits. In the high rise building, for every 2½ stories, or five inhabitable levels there is a maximum of one party or common corridor. Successive party corridors are horizontally displaced from each other. The third section is topped by a penthouse.

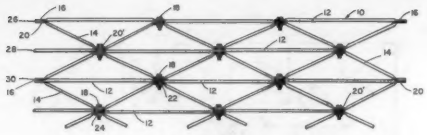
3,656,267
STRUCTURES OF TWO BASIC ELEMENTS

William H. Engle, Huntington, N.Y., assignor to Leslie I. Parker, Poughkeepsie, N.Y.

Continuation-in-part of application Ser. No. 694,901, Jan. 2, 1968, now Patent No. 3,501,876. This application Mar. 23, 1970, Ser. No. 21,687
Int. Cl. E04b *7/00*
U.S. Cl. 52—86 **4 Claims**

Structures fabricated of two basic elements comprising a plurality of long tubular frame elements generally arranged in

spaced rows and a plurality of short tubular frame elements angularly disposed between and interconnecting adjacent rows, the said long and short elements being bolted together

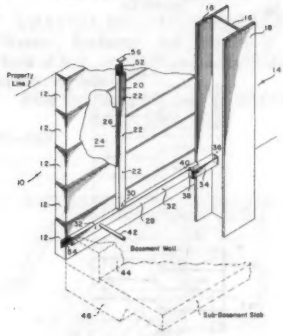


to form a plurality of modular sections of the arrangement and configuration necessary to fabricate the construction of the desired final size and shape.

3,656,268
DRAINAGE WALL SYSTEM AND METHOD OF ERECTING SAME

Efrahim Murati, G.P.O. 2948, Santurce, P.R.

Filed June 23, 1970, Ser. No. 49,059
Int. Cl. E02d *19/04*
U.S. Cl. 52—169 **20 Claims**



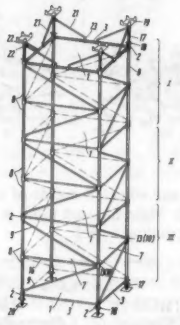
A drainage wall system and method of erecting same which may be constructed substantially along property lines without encroachment exteriorly of the property lines and without requiring thick beams of struts within the property lines as are requisite with steel sheet piling or other impermeable cofferdams. A permeable cofferdam is associated with a series of vertical column members and is provided with means for guiding water which seeps therethrough to a drainage system which removes the water and thereby the water pressure from the cofferdam. A reinforced concrete wall is alter added without impairing the effectiveness of the drainage system.

3,656,269
SUPPORT STRUCTURE OF FRAME WORK CONSTRUCTION

Klaus Witschel, Grobenzell, and Dieter Schone, Munich, both of Germany, assignors to Mannesmann Leichtbau, GmbH, Munich, Germany

Filed Nov. 9, 1970, Ser. No. 87,895
Claims priority, application Germany, Nov. 12, 1969, P 19 57 913.6
Int. Cl. E04g *1/06*
U.S. Cl. 52—638 **13 Claims**

A support structure of scaffold like frame work construction is assembled from similar, vertical frames disposed between vertically aligned, polygonal, horizontal frames. Each vertical frame has contour of an isosceles triangle established by three tubes, one serving as base and corner post, being vertically aligned with respective two vertically aligned corners of the horizontal frames. The apex of the tri-

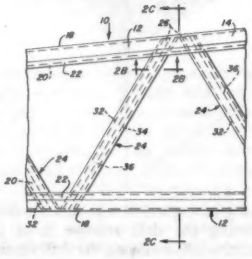


angle is provided with a holder receiving and locked to a collar in the middle of the corner pot of another frame. A horizontal brace extends between apex and collar of each vertical frame; spindles extend from the corners of the uppermost and from the lowermost horizontal frames for limited range height adjustment.

3,656,270
STRUCTURAL MEMBER

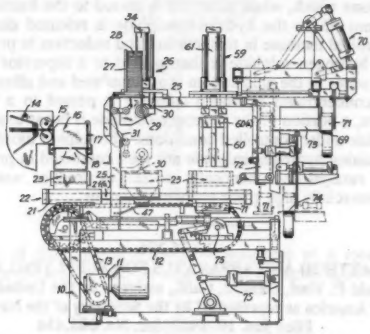
Boris Phillips, Los Angeles, Calif., assignor to United States Steel Corporation

Filed Feb. 18, 1970, Ser. No. 12,373
Int. Cl. E04b *1/38;* **E04c** *3/04*
U.S. Cl. 52—693 **11 Claims**



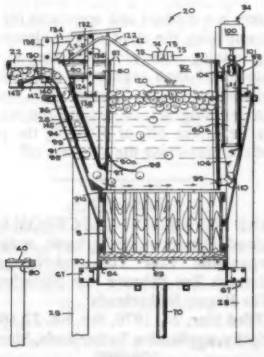
A structural member is disclosed having a male member of generally U-shaped cross section. The male member is provided with a pair of opposed male webs to provide opposed male contact surfaces. A male flange connects one end of each of the male webs and an external reinforcing flange projects outwardly from the other end of each of the male webs. A female member is adapted to fit inside the male member and is provided with a pair of opposed female webs to provide female contact surfaces. Each female contact surface is adapted to be disposed adjacent a registering male contact surface. An adhesive is disposed between each of the registering male contact surfaces and the female contact surfaces to bond the female member to the male member.

3,656,271
PACKAGING MACHINE
Ronald J. O'Shea, Somerville; Bernd W. Haase, Berkeley Heights, and Albert W. Hawkins, Princeton, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.
Filed Apr. 20, 1970, Ser. No. 30,069
Int. Cl. B65b *63/04*
U.S. Cl. 53—21 10 Claims



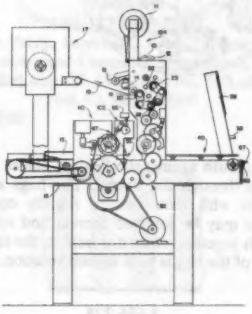
Apparatus and method are provided for automatically loading a desired quantity of flat, flexible bags into dispensing cartons which comprises, in combination, a stacker mounted adjacent to and aligned with a completed bag dispenser, said stacker having vibration means for automatically collecting a desired number of completed bags in an aligned stack, means for conveying said aligned stack of bags to a carton loading station, means for depositing a stiffening member over a predetermined portion of said aligned stack of bags, means for folding said stack of bags, means for conveying an empty carton from a continuous conveyor of empty cartons to said carton loading station, and means for automatically folding and stuffing said stack of bags into an empty carton at said carton loading station.

3,656,272
BIN FILLING APPARATUS
Charles E. Sheetz, Woodstock, Va., assignor to FMC Corporation, San Jose, Calif.
Filed Sept. 30, 1970, Ser. No. 76,867
Int. Cl. B65b *5/06*
U.S. Cl. 53—35 22 Claims



A bin filling apparatus wherein an empty bin is moved into position above a submerging tank filled with water. The tank is moved upwardly to totally submerge the bin, and apples are allowed to flow into the tank by means of a flow tube which allows the apples to be delivered beneath the surface of the water in the tank and above the bin whereby they float upwardly and are collected in a compact nested mass within a fixed fruit collector structure directly overlying the bin. When a sufficient number of apples have been thus collected the tank is lowered, and the collected fruit is deposited in the bin as a single unit without substantial disruption. The full bin is removed and replaced with an empty bin, and the process can then be repeated.

3,656,273
WRAPPING MACHINE
Andrew W. Anderson, West Caldwell; James Alexander, Belleville; Martin E. Leszczynski, Jersey City, and Lester A. Higgins, Montville, all of N.J., assignors to Scandia Packaging Machinery Company, North Arlington, N.J.
Filed Apr. 9, 1970, Ser. No. 26,937
Int. Cl. B65b *57/14*
U.S. Cl. 53—59 29 Claims

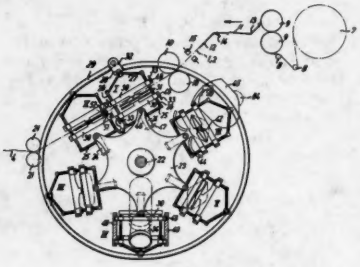


A wrapping machine is provided having a combination which enables the wrapping machine to be run in a fully automatic condition. The web of wrapping material is joined to a tear strip and subsequently fed to a sheet applying work station where individual wrapper sheets are cut from the web and placed over a package. A cutting means is provided to form a slit configuration in the web of wrapping material. This configuration includes two perforations extending longitudinally with respect to the tear strip on either side thereof and a perforation that crosses the two longitudinal perforations. A moving means including primary pushing means and auxiliary pushing means is used to feed packages at predetermined intervals into the wrapping machine. Sensing means are provided to detect any irregular package feed condition being conveyed by the moving means with a first responsive means functioning to stop the moving of the packages within the machine. A heat sealing means is used in this combination and is operably connected to a second means that is responsive to any shut down condition in the wrapping machine to move the heat sealing means away from any package that is being sealed therewith thereby preventing burning of the package. Each of the specific elements provides a function that overcomes various problems associated with wrapping machines now available in the prior art. There are several individual features set forth in the separate embodiments of this invention.

3,656,274
MACHINE FOR PRODUCING AND FILLING BAGS
Ove Andersen Vind, Aaboulevarden 40 A, 8700 Horsens, Denmark
Filed Apr. 27, 1970, Ser. No. 32,009
Claims priority, application Denmark, Apr. 29, 1969, 2367/69
Int. Cl. B65b *1/02, 43/04, 43/26*
U.S. Cl. 53—183 8 Claims

A machine for producing bags from two parallel strips of material and for filling a solid or liquid product into the bags.

The strips are welded together to form individual bags which are carried through subsequent stations, including filling and closing stations, suspended on two flexible blades engaging below folded edge zones of the strips. The blades are pulled apart to open the bag mouth in the filling station in which a two-part funnel is introduced into the bag mouth and opened



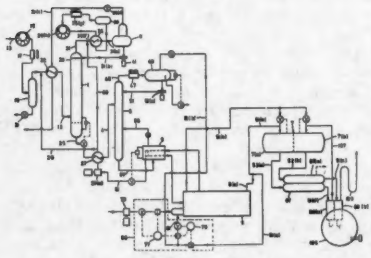
to clamp the mouth against the flexible blades while the bag is being filled through the funnel. The bags are fed to the closing station with their mouths slightly open so that a rotatable tube may be inserted therein and rotated to twist the bag mouth together while it is held to the tube by suction and the body of the bag is held against rotation.

3,656,275

PROCESS FOR THE REMOVAL AND CONCENTRATION OF A COMPONENT GAS FROM A MULTI-GASEOUS STREAM

Wesley L. Hunter, Houston, Tex., assignor to Ashland Oil, Inc., Houston, Tex.

Filed Jan. 20, 1968, Ser. No. 738,701
Int. Cl. B01d *53/14*
U.S. Cl. 55—31 **8 Claims**



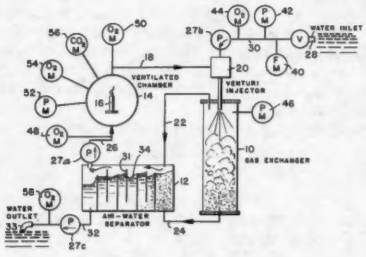
A process and related system for the removal and concentration of a component gas from a stream containing a plurality of gaseous components. The process is directed to the removal and subsequent concentration of a gas stream component in which the component exists as a particularly small percentage (as low as 1 percent or less) of the total stream volume. It is especially appropriate for the removal and concentration of organic and inorganic sulphur gases, such as hydrogen sulphide or sulphur dioxide from effluent acid gas streams. The system is of the regenerative liquid solvent type using an absorber tower and subsequent solvent fractionator. The solvent is injected into the absorber tower where contact is made with the acid gas stream having a component gas, such as the hydrogen sulphide, in relatively small quantity. The component gas is absorbed under closely controlled pressure and temperature conditions. In the case of hydrogen sulphide, the solvent used is preferably N-methyl-2-pyrrolidone which, when saturated is passed to the fractionator column where the hydrogen sulphide is released due to a controlled increase in temperature and reduction in pressure. The hydrogen sulphide is then passed to a separator where free water in the acid stream is accumulated and after which the concentrated hydrogen sulphide is passed to a boiler. There, a portion of the hydrogen sulphide is burnt to sulphur dioxide under controlled conditions. The sulphur dioxide and remaining hydrogen sulphide are then combined in presence of a catalyst and chemically reacted to produce water and commercially high grade elemental sulphur.

3,656,276

METHOD AND APPARATUS FOR SUPPLYING AIR

Harold P. Vind, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 10, 1967, Ser. No. 608,454
Int. Cl. B01d *19/00*; **A62b** *07/00*
U.S. Cl. 55—46 **3 Claims**



The invention is a method and apparatus for supplying air from water comprising the steps of and elements for any of the following: mixing stale air and water in intimate and agitated contact and then separating the resulting air and water, or bubbling stale air through the water and then removing the resulting air, or boiling the water and then removing the air driven off, or reducing the pressure upon the water and then removing the air given off.

3,656,277

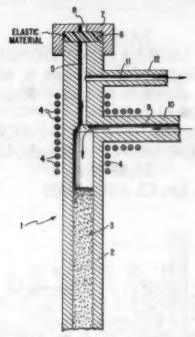
METHOD AND DEVICE FOR GAS CHROMATOGRAPHY

Peter Slingerland, Pijnacker, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast-Natuurweten-Schappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel en Verkeer, The Hague, Netherlands

Filed Mar. 24, 1970, Ser. No. 22,184
Claims priority, application Netherlands, Mar. 28, 1969, 6904800
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 **2 Claims**

An improved method and device for gas chromatography in which the ill effect of septum-bleeding is eliminated by al-

lowing a small stream of carrier gas to leak out of the top

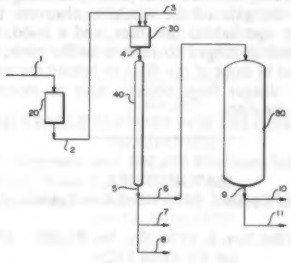


section of the column into the atmosphere at a location between the septum and the main stream of carrier gas.

3,656,278
GAS CHROMATOGRAPHIC SEPARATION OF AROMATIC MIXTURES

B. M. Drinkard; Paul T. Allen, and Edward H. Unger, all of Beaumont, Tex., assignors to Mobil Oil Corporation

Filed June 8, 1970, Ser. No. 44,460
Int. Cl. B01d *15/08*
U.S. Cl. 55—67 **12 Claims**



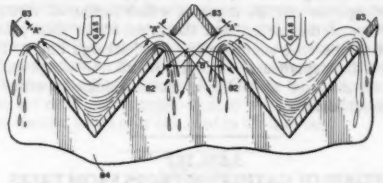
A mixture of C_8 aromatics, ethylbenzene, ortho-xylene, meta-xylene and para-xylene is separated into its component parts by production gas chromatography. The mixture is passed with a carrier in contact with a certain zeolite to separate the para-xylene and ethylbenzene by different sorption rates and the remaining mixture of meta- and ortho-xylene is contacted with a liquid partitioning agent to separate the ortho-xylene and meta-xylene by different sorption rates.

3,656,279
GAS SCRUBBER

Robert L. McIlvaine, Glencoe, and Roger E. Kent, Mount Prospect, both of Ill., assignors to National Dust Collector Corporation, Skokie, Ill.

Filed Apr. 17, 1970, Ser. No. 29,497
Int. Cl. B01d *47/00*
U.S. Cl. 55—240 **13 Claims**

A gas scrubber comprising a housing having an inlet and an outlet for gas, and a grid structure for introducing contaminant collecting scrubbing liquid into the gas flow. Said grid structure comprises a plurality of V-shaped, liquid troughs in spaced parallel array, having deflector vanes parallel and above the troughs and means for maintaining a relatively constant level of liquid in said troughs for distribution into the high velocity gas flow passing over and between ad-

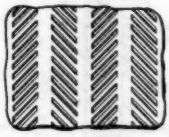


jacent troughs. Mechanical separator means is provided for removing contaminated scrubbing liquid from the gas after contaminants have agglomerated in the liquid from the gas.

3,656,280
ABSORPTION UNIT

Robert Bruce Perry, Lawrence, Kans., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 27, 1968, Ser. No. 755,681
Int. Cl. B01d *47/00*
U.S. Cl. 55—240 **1 Claim**

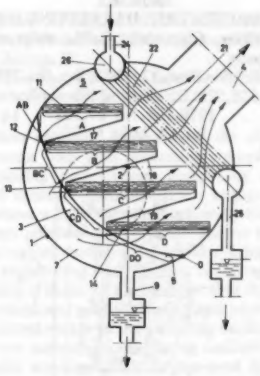


An absorption unit for the purification of gases having an improved absorption plate.

3,656,281
WATER SEPARATOR-SUPERHEATER

Parma Nand Bansal, Zurich, and Alois Sonnenmoser, Neuenhof, both of Switzerland, assignors to Aktiengesellschaft Brown Boveri & Cie, Baden, Switzerland

Filed Apr. 30, 1969, Ser. No. 820,599
Claims priority, application Switzerland, June 27, 1968, 9635/68
Int. Cl. B01d *46/12*
U.S. Cl. 55—269 **6 Claims**



A water-separator-superheater structure includes a horizontally disposed casing having a drum-shaped configura-

tion into which wet steam is admitted at the bottom portion of the drum. The wet steam is caused to flow upwardly at an angle through a plurality of horizontally disposed wire netting mattresses arranged in superposed stepped relation which serve to separate out the moisture which drains off through the bottom of the casing, and the dried steam then passes through a tube type superheater to a discharge outlet. The tubes of the superheater between which the dried steam passes are disposed at a steeply inclined angle in order to promote self-draining.

3,656,282

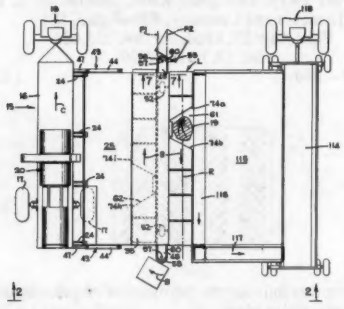
METHOD OF GATHERING CROPS FROM TREES

Glen E. Rauth, Winter Park, Fla., assignor to FMC Corporation, San Jose, Calif.

Original application Jan. 29, 1968, Ser. No. 701,273, now Patent No. 3,553,949. Divided and this application Apr. 20, 1970, Ser. No. 29,818

Int. Cl. A01g *19/08*

U.S. Cl. 56—1 **8 Claims**



A method for gathering crops on the run from a row of trees is practiced with apparatus which moves continuously past the trees. A loop of catch frames is provided on the apparatus, the loop having an inner run and an outer run. A gap is provided in the catch frame loop to receive a tree, and the catch frame loop is circulated on the moving apparatus to bring the gap into registration with the tree. The speed of the catch frame loop on the apparatus is maintained equal to the forward speed of the apparatus to hold the gap at the tree until the gap disengages the tree at the rear end of the outer run.

3,656,283

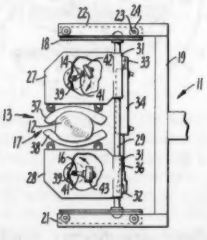
POWER DRIVEN TREE HARVESTING METHOD

Robert M. Shipley, Cloverdale, Calif., assignor to Kelsey-Hayes Company

Original application Sept. 12, 1968, Ser. No. 759,313, now Patent No. 3,548,578. Divided and this application Aug. 27, 1970, Ser. No. 67,302

Int. Cl. A01g *19/01*

U.S. Cl. 56—1 **1 Claim**



A tree harvesting method which comprises the applying to the tree trunk and substantially normal thereto a power driven vibratory displacement having a beat of varying frequency and amplitude.

3,656,284

DISC MOWER CONDITIONER

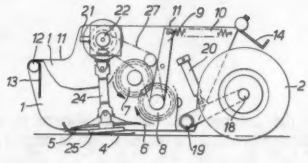
Nigel W. Meek, Aylesbury, and Robert S. Morris, Bicester, both of England, assignors to Sperry Rand Limited, Holborn Viaduct, London, England

Filed May 28, 1970, Ser. No. 41,338

Claims priority, application Great Britain, May 30, 1969, 27,657/69

Int. Cl. A01d *43/00*

U.S. Cl. 56—14.5 **11 Claims**



A combined crop mower and conditioner is disclosed which has a mower bar having at least two disc cutters and a pair of conditioning rolls behind and above the discs with the rotational axes horizontal. The discs and rolls are driven independently of the forward motion of the machine and are relatively positioned so that, in operation, cut crop is propelled by the cutter discs into the intake area of the conditioning rolls. For safety, the cutter bar and conditioning rolls are supported between end plates extending down to ground level, the axle of the machine obstructs the area below the rolls and behind the discs, and a hood, the rear portion of which is hinged to form a baffle plate, extends from above and in front of the discs to behind the rolls. This minimizes the danger from objects, such as stones, being thrown out by the discs.

3,656,285

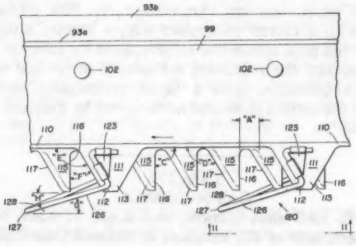
LAWNMOWER

Morris William Carlson, 5403 Northwest Boulevard, Davenport, Iowa

Filed Nov. 6, 1970, Ser. No. 87,485

Int. Cl. A01d *55/24*

U.S. Cl. 56—244 **22 Claims**



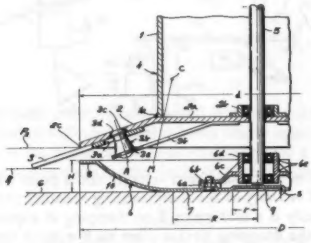
A power lawnmower is disclosed employing an endless moving band with integral teeth which cut the grass with a scissors-like action in conjunction with fixed teeth on a forwardly disposed, transverse cutting assembly through which the band passes. A particular feature of the mower is the provision of grass gathering elements which project from the moving teeth and travel therewith. The chief functions of such elements are to bring the grass into the teeth, to retain it there until cut in order to prevent the grass from being knocked down or aside by the moving teeth, and finally to

discharge the cuppings rearwardly. Improvements in the design of the moving and fixed teeth are also disclosed as well as foldable side extensions for the mower to increase its cutting width.

3,656,286
MOWING MACHINE

Joseph Glunk, Schiener-Berg-Stra. 11, and Heinz Gnadler, Steinerweg 6, both of 7702 Gottmadingen, Germany

Filed Oct. 30, 1970, Ser. No. 85,505
Int. Cl. A01d *55/18*
U.S. Cl. 56—294 **10 Claims**

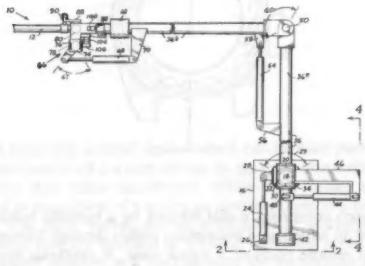


A mowing machine having at least one mower assembly with rotary blade means driven by a motor or the like and an upright shaft upon which the blade assembly is journaled. The blade assemblies are each supported by an upwardly concave dished disk glide or skid having a generally flat surface parallel to the ground in its central region and extending upwardly and outwardly with uniform light curvature. The rim of the dish is bent outwardly in a flange parallel to the ground surface so that the slide or skid is stiffened.

3,656,287
ADJUSTABLE SUPPORT FOR TREE SHAKING MECHANISM

Frank W. Morrison, and Jerry E. Morrison, both of 2408 E. 14th Street, Route 1, The Dalles, Oreg.

Filed June 23, 1969, Ser. No. 835,419
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 TS **10 Claims**

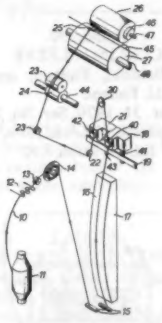


The support of the invention includes a base on which an upright standard is rotatably mounted. Supported on the upright standard and rotatable on its own axis which extends at right angles to the axis of the standard is an elongated arm having an upright axis pivot joint intermediate its ends. The arm is also tiltable relative to the horizontal. Individual fluid operated cylinders are provided to rotate the upright standard relative to the base, to rotate the arm on its own axis, to vary the angular disposition of the two arm sections at their jointed connection, and to tilt the arm relative to the base. The outer end of the arm has an angular portion on which an upright head is supported including further adjustments for manipulation of a shaker mechanism. Such head has rotatable support on an upright axis and supports a shaker rod for longitudinal or axial movement of the rod, as well as rotating movement of the rod on its own axis. In addition, the shaker rod is supported on the head for tilting adjustment relative to the horizontal. Fluid operated cylinders are employed to rotate the head on its upright axis, to move the rod axially, to rotate the rod on its own axis, and to tilt the rod.

3,656,288
FALSE TWIST TEXTURIZING METHOD AND APPARATUS

Reginald Selby Gilchrist, Welwyn Garden City, England, assignor to The Klinger Manufacturing Company, Ltd., London, England

Continuation-in-part of application Ser. No. 789,653, Dec. 26, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 661,319, Aug. 17, 1967, now abandoned. This application Dec. 11, 1969, Ser. No. 884,080
Claims priority, application Great Britain, Sept. 3, 1966, 39,491/66; Dec. 16, 1968, 59,749/68
Int. Cl. D02g *1/02*
U.S. Cl. 57—34 HS **17 Claims**



Yarn is false twisted first in one sense and then in the opposite sense to produce an essentially zero torque texturized yarn. For this purpose, false twist spindles are provided to twist the yarn in opposite senses.

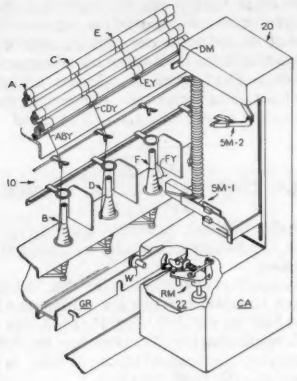
3,656,289
YARN PIECING APPARATUS REGISTRATION MEANS

James K. Merck, Piedmont, S.C., assignor to Maremont Corporation, Chicago, Ill.

Filed Apr. 22, 1970, Ser. No. 30,768
Int. Cl. D01h *9/00, 9/14*
U.S. Cl. 57—54 **11 Claims**

A registration means is disclosed for the alignment of a piecing apparatus with yarn processing stations of a textile machine requiring yarn repair, comprising control cam means which controls the registration engagement of the piecing apparatus with the textile machine by the registration means through provision of a counterbias or holding function, a registration camming means for bringing the apparatus into registration with stations requiring yarn repair and maintaining it there by engagement with the machine in a camming action, and resilient biasing and joining means for joining the control means to the camming means and providing a bias to the camming means for its resilient engagement with the textile machine. Such engagement may be made with camming notches or slots in a guide rail of the machine in register with the stations, or any other suitable way such as with camming projections from the machine. In one embodi-

ment, the camming means may be a cam follower lever arm with a roller for engagement with the machine, and in

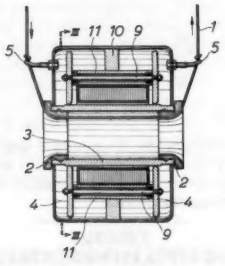


another a plunger rod for entry into registration slots in the machine, such as in a guide rail.

3,656,290
CURLING SLEEVE

Pekka Kuussaari, Helsinki, Finland, assignor to Spinner Osakeyhtio, Helsinki, Finland

Filed Mar. 31, 1970, Ser. No. 24,236
Claims priority, application Finland, Feb. 19, 1970, 438/70
Int. Cl. D01h *7/92*
U.S. Cl. 57—77.4 **5 Claims**



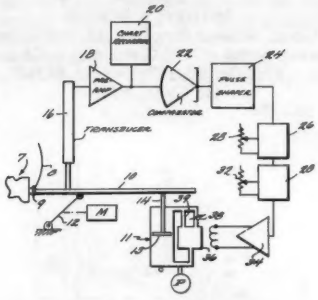
A curling sleeve for producing false twist on thermoplastic filament passed through the sleeve, the latter having friction rings at one or both ends, and the sleeve constituting the rotor of an electric motor.

3,656,291
CONTROL OF THE MOTION OF A RECIPROCATING MEMBER

Kenneth Andrew Key, Abergavenny, and Clive Williams Hooper, Newport, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of application Ser. No. 780,519, Dec. 2, 1968, now abandoned. This application Dec. 16, 1970, Ser. No. 98,718
Claims priority, application Great Britain, Dec. 8, 1967, 55,964/67
Int. Cl. D01h *13/06*
U.S. Cl. 57—156 **4 Claims**

In a method of operating a yarn traversing mechanism of the kind in which a reciprocating member is driven from a power source through at least one force-transferring member and in which the motion of the reciprocating member is adapted to be damped by a damping device, the improvement which comprises: detecting the time of zero velocity of the reciprocating member; actuating the damping device at a

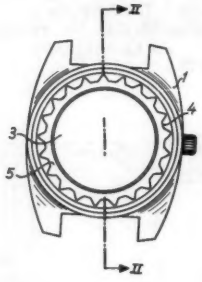


point in time between said zero velocity and a point when the increment of velocity of the reciprocating member above the desired velocity is a maximum if no damping is applied; and deactuating the damping device after such a short time that the damping does not cause undesirable distortion of the force-transferring member.

3,656,292
WRIST-WATCH WITH BOTTLE CAP DIAL AND MOVEMENT HOLDER

Zeno Hurt, Moehlin, Switzerland, assignor to AGON Fabrique d'horlogerie Robert Triebold S.A., Mumpf, Switzerland

Filed Apr. 2, 1971, Ser. No. 130,719
Claims priority, application Switzerland, Apr. 10, 1970, 5299/70
Int. Cl. G04b *19/06*
U.S. Cl. 58—94 **2 Claims**



A watch comprises a dial formed by a metallic bottle cap carrying an advertising inscription visible through transparent top and middle parts of a watch case. A synthetic material lining in the cap supports a watch movement housed therein.

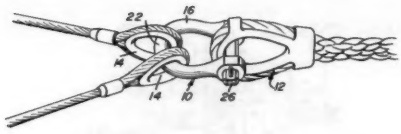
3,656,293
MARINE TOWING SHACKLE

Archie J. Lowery, Sr., 500 Avenue J, Marrero, La.

Filed Jan. 14, 1970, Ser. No. 2,867
Int. Cl. F16g *15/06*
U.S. Cl. 59—86 **2 Claims**

A U-shaped body including spaced apart generally parallel opposite side legs joined at one pair of corresponding ends by

a generally semi-circular bight portion whose opposite ends merge smoothly into the adjacent leg ends. The legs are slightly convergent toward the other end thereof and include enlarged slightly angulated terminal end portions which



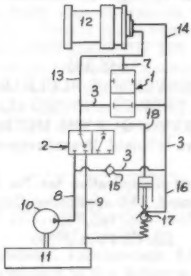
parallel each other. The enlarged terminal ends of the legs are provided with aligned oval bores whose major dimensions extend in the plane of the U-shaped body and a pin which is oval in cross-section is removably secured through the bores.

3,656,294

HYDRAULIC CONTROL DEVICE

Pierre A. Praddaude, Crepy-en-Valois, France, assignor to Societe Anonyme Poclain, Le-Plessis-Belleville, Oise, France

Filed Feb. 7, 1969, Ser. No. 797,594
Claims priority, application France, Feb. 7, 1968, 139019
Int. Cl. F15b *11/08, 13/04*
U.S. Cl. 60—1 **12 Claims**



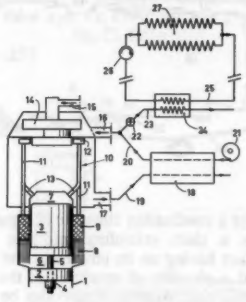
An hydraulic control device which can be used particularly for the control of a winch driven by an hydraulic motor, having two slide valve distributors, whose slide valves are subjected to the action of a spring to position them in a rest position. The slide valves are each capable of occupying two positions and are coupled to a single operating lever. A first distributor situated in a duct ensures the permanent opening of the duct in the rest position while the second distributor situated in series with the first, is of the reversing device type and places the first distributor in selective communicating with two other ducts connected respectively to a source of fluid under pressure and to a discharge reservoir. The rest position of the second distributor corresponds to the connection of the first with the reservoir. The slide valve of the first distributor is coupled on the one hand to a single acting ram supplied by the fluid conveyed between the first and the second distributor.

3,656,295

HEATING DEVICE FOR A VEHICLE UTILIZING A HOT-GAS ENGINE

Herman Fokker, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 27, 1970, Ser. No. 40,872
Claims priority, application Netherlands, June 5, 1969, 6908536
Int. Cl. F03g *7/06;* **B60h** *1/20*
U.S. Cl. 60—24 **8 Claims**



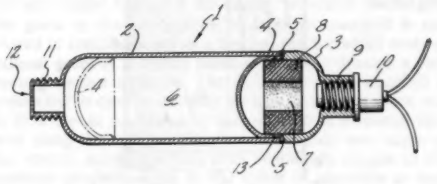
A hot-gas engine having a system for heating a fluid such as water with heat from some of the air that is pre-heated for combustion in the engine's burner, the fluid providing heat via a heat exchanger to the atmosphere.

3,656,296

FLUID PRESSURE INTENSIFIER

Donald F. Wills, Suffield, Conn., assignor to Pilot Research Corporation, Valdese, N.C.

Filed June 12, 1969, Ser. No. 832,794
Int. Cl. F01b *29/08*
U.S. Cl. 60—26.1 **10 Claims**

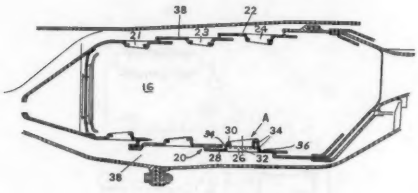


A plunger containing a frangible section is secured in a pressure vessel, dividing the vessel into a first and a second compartment. The first compartment contains a compressed gas, and the second compartment contains a solid gas charge to exert a pressure on the plunger and break the frangible section, thus releasing the plunger for axial sliding movement in the vessel to further compress the gas. The plunger is made of a thermally conductive material allowing the heat energy in a second compartment to pass into the first compartment energizing the compressed gas.

3,656,297
COMBUSTION CHAMBER AIR INLET

Jeffrey Keith Monk, Belper, England, assignor to Rolls Royce Limited, Derby, England

Filed Aug. 28, 1970, Ser. No. 67,959
Claims priority, application Great Britain, Sept. 4, 1969, 43,934/69
Int. Cl. F02c 9/14
U.S. Cl. 60—39.23 5 Claims

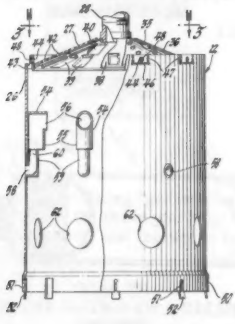


An air inlet for a combustion chamber of a gas turbine engine comprises a duct extending into the combustion chamber, the duct having on its innermost end an inwardly directed lip and a plurality of apertures in the wall of the duct adjacent said end. Apertures may also be provided in the junction between the duct and the lip and the end of the inlet having the lip may be inclined at an acute angle to the axis of the combustion chamber.

3,656,298
COMBUSTION APPARATUS

Wallace R. Wade, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1970, Ser. No. 93,019
Int. Cl. F02c 3/00, 7/08
U.S. Cl. 60—39.65 5 Claims

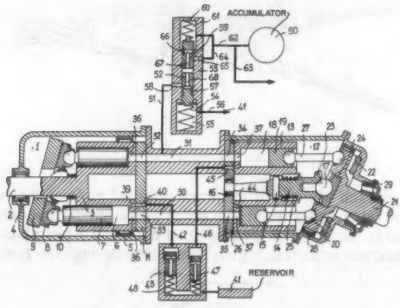


A gas turbine combustion apparatus includes a cylindrical combustion liner with a dome through which primary combustion air is admitted in part. Film cooling air is admitted between the dome and the side wall to flow along the side wall and additional primary combustion air is admitted through mixing devices which mix the air with some combustion products, the resulting mixing being cooled in part by the combustion liner film cooling air. The result is to dilute oxygen at the flame and lower combustion temperatures, and therefore minimize formation of oxides of nitrogen.

3,656,299
HYDROSTATIC TRANSMISSIONS

Jacques Fleury, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France

Filed Oct. 2, 1970, Ser. No. 77,403
Claims priority, application France, Oct. 17, 1969, 6935754
Int. Cl. F16d 31/02; F15b 1/02
U.S. Cl. 60—53 A 11 Claims

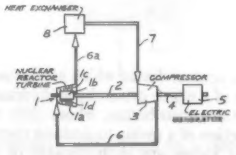


This hydrostatic transmission comprising a hydrostatic machine normally operating as a generator and at least one hydrostatic machine normally operating as a receiver or load apparatus, these machines being of the barrel-cylinder type comprising distributor plates formed with ports inter-connected by high-pressure and low-pressure duct means, is characterized in that at least one of said distributor plates comprises an auxiliary port connected via an auxiliary circuit to a fluid reservoir through the medium of a non-return valve.

3,656,300
METHOD OF CONVERTING NUCLEAR ENERGY TO MECHANICAL ENERGY AND INSTALLATION FOR CARRYING OUT THE METHOD

Nils Anders Lennart Wikdahl, Bravallavagen 42, Djursholm, Sweden

Continuation-in-part of application Ser. No. 599,523, Dec. 6, 1966, now abandoned. This application Oct. 11, 1968, Ser. No. 766,740
Int. Cl. F01k 27/00
U.S. Cl. 60—59 14 Claims

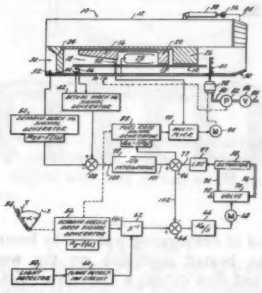


A method and an installation for converting nuclear energy to mechanical energy by incorporating fissionable material in at least some of the vanes defining a continuous tortuous duct in a turbine, directing a compressed fluid flow through said duct, extending this fluid flow in at least part of the duct to effect transfer of released nuclear energy to the fluid flow and directing the fluid flow upon the driving vanes of the turbine to effect rotation thereof thereby converting the released nuclear energy to mechanical energy.

3,656,301
COMPENSATED FEEDBACK GAS TURBINE AUGMENTATION CONTROL SYSTEM

Herbert Katz, Cincinnati, Ohio, assignor to General Electric Company

Filed Nov. 25, 1969, Ser. No. 879,794
Int. Cl. F02k 1/16
U.S. Cl. 60—236 **10 Claims**

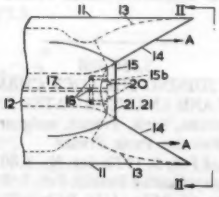


A control system for a gas turbine engine having an augmenter combustion system and a variable area exhaust nozzle. The control system is applicable to both turbofan and to straight turbojet engines. In the turbofan application, a signal generator schedules the exhaust nozzle area as a function of throttle position and augmenter fuel flow as a function of exhaust nozzle area. An error signal generated between desired fan duct mach number and actual fan duct mach number is integrated and applied to both the augmenter fuel rate generator and the exhaust nozzle area generator. In this manner, during steady state operations, the exhaust nozzle position maintains a desired mach number and the throttle lever position maintains augmenter fuel flow rates. During transients, the exhaust nozzle area position controls the augmenter fuel flow. In the turbojet application the fan duct mach number error signal is replaced by a turbine temperature error signal and the system operates essentially as described above.

3,656,302
MULTIPLE JET, AIRCRAFT ENGINE EXHAUST INSTALLATION

Lionel Henry Townend, Farnborough, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Aug. 11, 1970, Ser. No. 62,989
Claims priority, application Great Britain, Aug. 11, 1969, 40,079/69
Int. Cl. F02k 3/10, 3/12, 1/06
U.S. Cl. 60—261 **13 Claims**

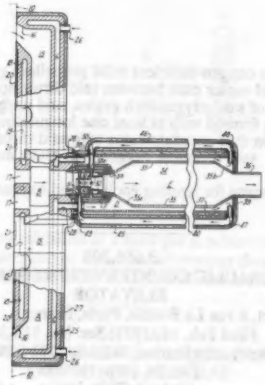


A multiple jet, aircraft engine exhaust installation comprising at least two engine exhaust nozzles, aircraft structure joining said exhaust nozzles, means for supplying fuel to be burnt at a region immediately aft of said joining aircraft structure, outlet orifices terminating said exhaust nozzles at exit planes, said exit planes being convergent in the upstream sense, ducts defining an outlet passage for exhaust gases in said nozzles and extending from duct throats within said nozzles to said outlet orifices and wherein said ducts are shaped in accordance with the supersonic Prandtl-Meyer flow theory of supersonic expansion.

3,656,303
COMBUSTION ENGINE POLLUTION CONTROL

Robert C. La Force, 514 West View Drive, Beaver, Pa.

Filed Apr. 13, 1970, Ser. No. 27,590
Int. Cl. F01n 3/10
U.S. Cl. 60—273 **12 Claims**



Procedure and apparatus have been developed for utilizing retained heat of hot exhaust gases being discharged from an internal combustion engine and for controlling the temperature of the gases to prevent damage to metal walls, maximize the oxidation of carbons and hydrocarbons, prevent the forming of nitrogen oxides, and promote the breakdown of nitrogen oxides formed in the engine, all before discharging the gases to the atmosphere. A jacketed manifold is employed in combination with a thermal reactor which receives exhaust gases in a central reaction chamber through a connecting venturi aspirator. The jacketing of the manifold is connected to draw-in ambient air into its vacuum space and to flow the air as heated by the manifold in a reverse flow path along the reaction chamber and thence into stages of the venturi aspirator to mix with and supply oxygen to the aspirator proportionately to the speed of operation or load demand of the engine, with the aspirator serving as means for providing a controlled intake of ambient air into the manifold.

3,656,304
ROCKET MOTOR

Edward E. McCullough, Brigham City, Utah, assignor to Thiokol Chemical Corporation, Bristol, Pa.

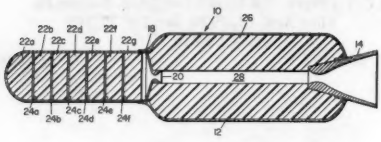
Filed July 19, 1966, Ser. No. 566,330
Int. Cl. F02k 9/04
U.S. Cl. 60—254 **5 Claims**

1. A rocket motor comprising:
a motor case having a thrust nozzle mounted on the aft end

thereof;

a plurality of oxygen-rich solid propellant grains tandemly disposed within said motor case;

a plurality of baffles respectively disposed between adjacent end surfaces of said oxygen-rich grains, each of said baffles being formed of a heat-resistant material so that each of said grains can be burned without igniting the adjacent one of said grains forward thereof, and each of said baffles being removable by gas generated by combustion of the adjacent one of said grains forward thereof;



at least one oxygen-deficient solid propellant grain disposed within said motor case between said thrust nozzle and the rearmost of said oxygen-rich grains, said oxygen-deficient grain being formed with at least one longutidinally-extending perforation that communicates with said thrust nozzle and said rearmost oxygen-rich grain; and

igniting means for igniting each of said oxygen-rich grains.

3,656,305

HYDRAULIC COUNTERWEIGHT FOR BOAT ELEVATOR

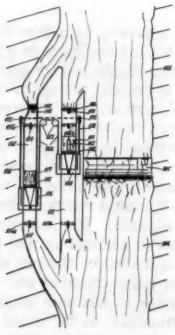
Jean Aubert, 8 rue La Boetie, Paris, France

Filed Feb. 18, 1971, Ser. No. 116,338

Claims priority, application Belgium, Feb. 24, 1970, 85576; Feb. 26, 1970, 7006988

Int. Cl. E02c *3/00*

U.S. Cl. 61—8 **16 Claims**



A hydraulic counterweight device for a boat elevator of the "water-slope" type which comprises a navigation and an auxiliary channel disposed between an upstream and a downstream pool. In both channels a mass of water is retained by a movable gate which is pushed up or pulled down the channel by a carriage movable on the banks of the channel, the two carriages being interconnected by cables. The invention provides that the auxiliary channel which is not used to transport boats, has a length substantially equal to that of the navigation channel and a slope which is less than or equal to that of the navigation channel, so that the downstream end of the auxiliary channel is located at a level which is higher than or the same as the level of the downstream pool.

3,656,306

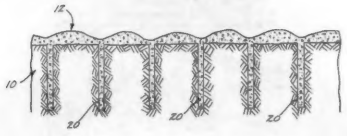
METHOD OF DEHYDRATING WET SOIL

Ervin T. Thorpe, Des Moines, Iowa, assignor to Des Moines Asphalt Paving Company, Des Moines, Iowa

Filed Nov. 16, 1970, Ser. No. 89,627

Int. Cl. E02d *3/12*

U.S. Cl. 61—36 **8 Claims**



The method of dehydrating wet soil by heating aggregate, spreading the heated aggregate on the wet soil to be dehydrated, and then cutting a plurality of slits in the soil to permit the heated aggregate to move into the slits.

3,656,307

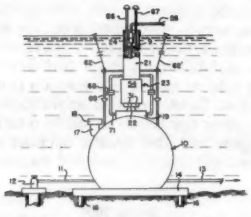
SUBSEA FLUID PROCESSING FACILITY

George E. Mott, Metairie, La., assignor to Texaco Inc., New York, N.Y.

Filed June 1, 1970, Ser. No. 42,405

Int. Cl. E02b *1/00*

U.S. Cl. 61—63 **6 Claims**



The invention relates to a subsea installation for removing and processing petroleum products such as crude oil and natural gas. The installation includes an under water facility anchored to the sea floor, holding fluid storage tanks as well as processing equipment. The facility is enclosed within a housing and communicated with a source of raw product by way of one or more subsea well heads which provide a continuous flow thereto. The unit further includes a buoyant mast extending upward therefrom, which mast is pivotally connected to said housing and supports conduits for liquid, gas, and electrical conductors which extend to the water's surface.

3,656,308

SYSTEM FOR JOINING THE LOCK CHAMBERS OF A SUBMARINE AND AN UNDERWATER ENCLOSURE

Francisco M. Serrano, Paris, France, assignor to Compagnie Francaise Des Petroles, Paris, France

Filed Feb. 5, 1970, Ser. No. 8,801

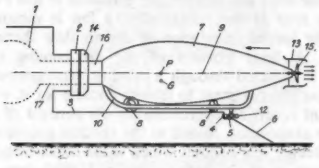
Claims priority, application France, Feb. 5, 1969, 6902512

Int. Cl. B63c *11/34;* **B63g** *8/00*

U.S. Cl. 61—69 R **9 Claims**

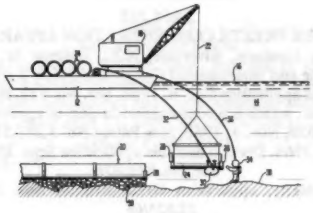
An underwater enclosure on the sea bottom has an approach ramp leading to a horizontal submarine landing plat-

form. The edge of the platform forms a circular, toric, lateral guide track, and a lock chamber for entering the enclosure is positioned above the platform. A submarine rides up the ramp on skis until vertical axle wheels in its stern engage the



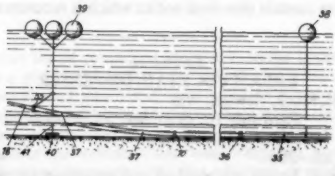
guide track. Wheels are then lowered from the skis and the submarine is maneuvered on the platform until its lock chamber is aligned with and joined to the lock chamber of the enclosure.

3,656,309
PIPE LAYING METHOD AND APPARATUS
John H. Bultema, 625 Seminole Road, Muskegon, Mich.
Filed Aug. 28, 1970, Ser. No. 67,707
Int. Cl. E01g *3/10*
U.S. Cl. 61—72.1 **13 Claims**



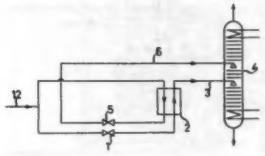
This disclosure relates to a method and apparatus for laying subaqueous pipelines to a specified line and grade by means of inflatable bags which are positioned beneath an end of each pipe section as it is laid in place. The fluid pressure in the inflatable bags is adjusted, preferably by inflating the bags, in order to position each pipe section at a predetermined grade.

3,656,310
METHOD FOR LAYING SUBMARINE PIPELINES
Andre Brun, Hauts-de-Seine; Pierre P. Orieux, Paris, and Louis Le Therisien, Hauts-de-Seine, all of France, assignors to Compagnie Francaise Des Petroles, Societe Anonyme, Paris, France
Filed Nov. 13, 1969, Ser. No. 876,411
Claims priority, application France, Nov. 14, 1968, 173675
Int. Cl. F16l *1/00*
U.S. Cl. 61—72.3 **9 Claims**



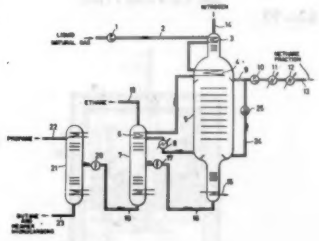
A method of laying pipes to form an underwater pipeline where pipes are floated to the point of immersion. A mud is injected into a floating pipe to sink the pipe to a predetermined level for connection with a submerged pipe. The pipe sections are connected by conventional means, and the procedure is repeated until the pipeline is finished. Traction arms and stoppers can be added to the pipe prior to immersion to assist in the laying of the pipeline.

3,656,311
RECTIFICATION BY DIVIDING THE FEED GAS INTO PARTIAL STREAMS
Otto Kaiser, Rodenbach, Germany, assignor to Messer Griesheim GmbH, Frankfurt, Germany
Filed Nov. 13, 1968, Ser. No. 775,402
Claims priority, application Germany, Nov. 15, 1967, P 15 51 607.1
Int. Cl. F25j *3/02, 5/00*
U.S. Cl. 62—28 **2 Claims**



Improved rectification of a feed gas is achieved by dividing the feed gas into two or more partial streams that are then introduced at different levels in the rectification zone.

3,656,312
PROCESS FOR SEPARATING A LIQUID GAS MIXTURE CONTAINING METHANE
Martin Streich, Nieder-Eschbach, Germany, assignor to Messer Griesheim GmbH, Frankfurt, Germany
Filed Dec. 16, 1968, Ser. No. 784,102
Claims priority, application Germany, Dec. 15, 1967, P 15 51 609.3
Int. Cl. F29j *3/00, 3/02*
U.S. Cl. 62—28 **2 Claims**

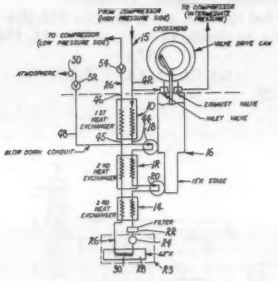


A liquid gas mixture containing methane is pumped at a pressure below the critical pressure of methane through a heat exchanger in the top part of a rectifying column to reliquefy methane vapor prior to discharge of the mixture into the lower part of the rectifying column, while liquid enriched in higher boiling components of the mixture accumulating at the bottom of the column is heated. The reliquefied methane withdrawn from the column may be pumped at the pressure desired for its utilization.

3,656,313
HELIUM REFRIGERATOR AND METHOD FOR DECONTAMINATING THE REFRIGERATOR

George M. Low, Acting Administrator of the National Aeronautics & Space Administration with respect to an invention of, and Ervin R. Wiebe, 14202 Osborne Street, Panorama City, Calif.

Filed Feb. 5, 1971, Ser. No. 112,999
Int. Cl. F25b 47/00
U.S. Cl. 62—85 3 Claims

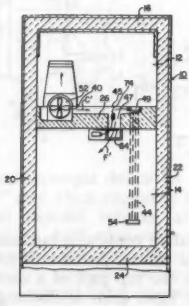


For use in a multi-stage refrigeration system an improved heat exchanger of a type having an hermetically sealed housing and including therewithin a pair of chambers defining a pair of concentrically related countercurrent passages extending therethrough. A particular feature of the invention is embodied in a decontaminating system which includes a circuit pneumatically coupled with a given heat exchanger and adapted to vent the heat exchanger to atmosphere and to flush the vented heat exchanger with a gas delivered under pressure and at ambient temperature so that frozen contaminants operatively are melted and simultaneously expelled from the system.

3,656,314
CONTROL APPARATUS FOR A TWO TEMPERATURE REFRIGERATOR

Robert C. Jung, Columbus, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 10, 1970, Ser. No. 53,964
Int. Cl. F25d 17/06
U.S. Cl. 62—97 11 Claims

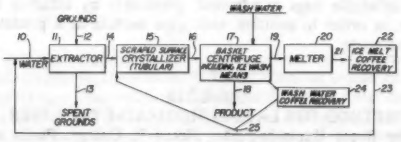


A refrigerator is disclosed which is provided with two separate compartments, one being a freezing compartment and the other being a fresh food compartment and with a single thermostat and damper arrangement to provide two temperature control within the refrigerator enclosure. The air distribution system includes a conduit disposed in the divider between the freezing compartment and the fresh food compartment and in which the evaporator is situated. Air inlets at the front of the refrigerator provide for the entrance of air from the fresh food and freezer compartment to this evaporator. At the rear of the refrigerator, a fan is disposed for providing for forced circulation of the air flow through the evaporator. A large portion of the air coming off the evaporator is directed through a conduit arrangement back to the freezer compartment to furnish cooling for it, with this compartment receiving approximately 90 percent of the air through the evaporator. Joined to the conduit providing cold air to the freezer is a conduit which leads down through the rearward portion of the refrigerator and discharges an air flow around a meat keeper or vegetable crisper contained in the fresh food compartment. A second conduit is also joined to the conduit supplying cooled air to the freezer, with this conduit being provided with a damper arrangement to adjustably maintain the air flow therethrough to the fresh food compartment. A thermostat is disposed adjacent the juncture of the last two mentioned conduits, with this thermostat controlling the operation of the evaporator so as to maintain a substantially uniform cooling temperature in the freezer. The temperature in the fresh food compartment, of course, may be adjustably maintained based on the setting of the aforementioned damper.

3,656,315
COFFEE FREEZE CONCENTRATION APPARATUS

Neophytos Ganiaris, Riverside, N.Y., assignor to Struthers Scientific and International Corporation, New York, N.Y.

Original application Dec. 8, 1965, Ser. No. 512,365, now abandoned, which is a continuation-in-part of application Ser. No. 321,020, Nov. 4, 1963, now Patent No. 3,283,522, dated Nov. 8, 1966. Divided and this application Sept. 29, 1969, Ser. No. 870,816
Claims priority, application Great Britain, Nov. 25, 1966, 52,925/66
Int. Cl. B01d 9/04
U.S. Cl. 62—124 1 Claim



A system of apparatus is disclosed which concentrates coffee extracts by freeze concentration in which the ice formed in a crystallizer is centrifuged from coffee extract and then is washed in the centrifuge and melted. The washings and melted ice contain dissolved coffee which is recovered.

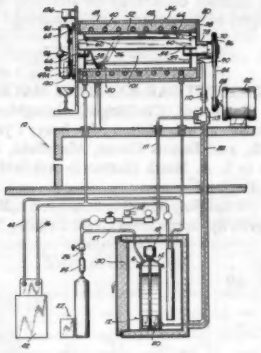
3,656,316
CREAM COCKTAIL DISPENSER

Arnold H. Stock, Newton, Wis.

Filed July 10, 1970, Ser. No. 53,816
Int. Cl. F25c 7/10
U.S. Cl. 62—306 4 Claims

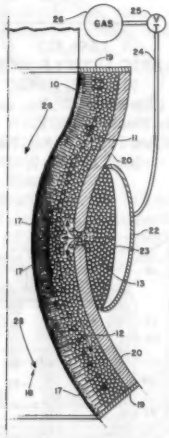
Disclosed herein is a method and apparatus for preparing and dispensing large quantities of frozen cream cocktails. The apparatus includes a remote mixing and storage chamber

which contains a quantity of custard cream and liquor in preselected proportions. An agitator in the mixing chamber continuously mixes the ingredients which are conveyed by air



pressure to a freezing chamber upon actuation of a dispensing valve. The cream-liquor mix is aerated by an air injector as the mix is conveyed to the freezing chamber.

3,656,317
ABLATIVE SYSTEM
Vernon H. Gray, Bay Village, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed June 17, 1970, Ser. No. 47,063
Int. Cl. F25b *19/00*
U.S. Cl. 62—467 **10 Claims**

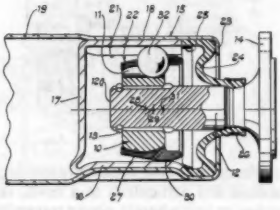


A carrier liquid containing ablative material bodies is supplied to a plenum chamber one wall of which has openings therethrough and which wall is exposed to a high temperature environment. The liquid and the bodies pass through the openings in the wall to form a self-replacing ablative surface.

In another embodiment the wall comprises honeycomb layers. Spheres containing ablative whiskers or wads, and a hardening catalyst for the carrier liquid are dispersed in the liquid.

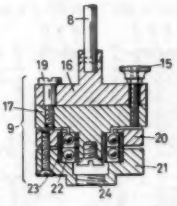
Yet another embodiment utilizes wicks woven of ablative material fibers, and extending through the openings in the wall and into the plenum chamber containing the carrier liquid.

3,656,318
CONSTANT VELOCITY UNIVERSAL JOINTS
Henry Thomas Smith, near Lichfield, and Thomas Hughes Millward, Sutton Coldfield, both of England, assignors to GKN Birfield Transmissions Limited, Erdington, Birmingham, England
Filed Sept. 9, 1970, Ser. No. 70,867
Claims priority, application Great Britain, Sept. 9, 1969, 44,513/69
Int. Cl. F16d *3/30*
U.S. Cl. 64—21 **10 Claims**



A constant velocity universal joint including an inner member and an outer member with torque-transmitting balls therebetween has an outer member constituted by a tubular metal element shaped to provide the ball tracks and this shaped metal element is contained within and fixed against movement relative to an end portion of a propeller shaft.

3,656,319
APPARATUS FOR CLEANING SMALL PARTS
Hans Schmidbauer, 77 Singen, Hohentwiel, Germany
Filed Oct. 21, 1969, Ser. No. 868,127
Claims priority, application Germany, Sept. 5, 1969, P 19 45 027.2
Int. Cl. F16d *3/06*
U.S. Cl. 64—23.6 **8 Claims**

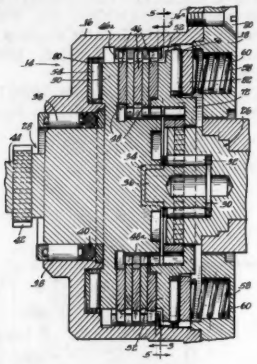


Apparatus for cleaning small parts such as assembled watches, or watch parts in a basket, wherein supporting structure may be adjusted for vibratory or elliptical motion when cleaning assembled watches or circular motion when cleaning parts in a basket. The supporting structure involves a motor driven plate rotatable about its central axis, and a work supporting plate carried thereby and adjustable between a concentric position and an eccentric position.

3,656,320
CLUTCH CONTROLLED DRIVE MECHANISM

Rudolph J. Belansky, Elmhurst, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 13, 1970, Ser. No. 54,437
Int. Cl. F16d 3/10
U.S. Cl. 64—24 21 Claims

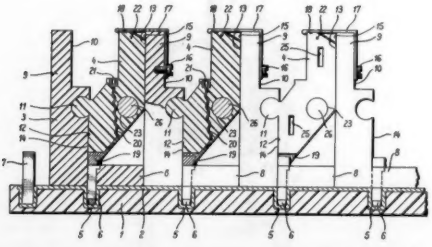


The present invention relates generally to clutch controlled drive mechanisms and particularly to a novel, self-contained drive mechanism or unit wherein power transmitted from the input shaft means to the output shaft means is governed through the agency of clutch means. The embodiment of the invention disclosed herein contemplates a self-contained unit comprising a housing, input shaft means and output shaft means rotatably supported in said housing, clutch means in said housing for locking said input and said output shaft means against rotation with respect to the housing, and cam means operable as an incident to a limited degree of relative rotative movement experienced by the input and output shaft means for overcoming the locking effectiveness of the clutch means.

3,656,321
DEVICE FOR CONTROLLING THE JACKS OF JACQUARD MACHINES

Karl Flad, 7411 Undingen, Hauptstrasse 29, Germany

Filed Sept. 30, 1969, Ser. No. 862,332
Claims priority, application Germany, Oct. 7, 1968, P 18 00 793.7
Int. Cl. D04b 15/70
U.S. Cl. 66—75 21 Claims

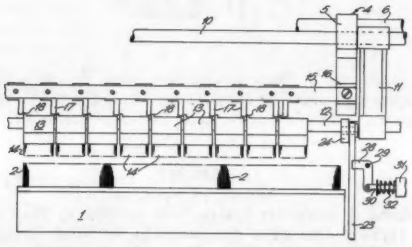


Knitting machine with needle selecting device enabling the needles to be selected by means of electro-magnets in accordance with a pattern stored in an information carrier including a read-out device for connecting the stored information into electrical signals which are fed to the electro-magnets, wherein the pattern of the total operative width of the knitting machine as provided on the information carrier is displaceable along the width of the machine by displacing a contact bank on said information carrier, the information carrier including a collector strip for each signal output of the read-out device disposed on a base plate, the collector strips being selectively connected to the contact bank containing individual contacts connected to at least one electromagnet and being transversely disposed with respect thereto so that the contact bank may be slideably disposed by integral multiples of the collector strip spacing.

3,656,322
STRAIGHT BAR KNITTING MACHINES

Frederick Raymond Challenger, Loughborough; Barry Frederick Swanwick, Melton Mowbray; Cyril Ivan Cotton, Rainworth, and Dennis Gaunt, Mansfield, all of England, assignors to S. A. Monk (Sutton in Ashfield) Limited, Nottingham, England

Filed July 6, 1970, Ser. No. 52,259
Claims priority, application Great Britain, July 7, 1969, 34,166/69
Int. Cl. D04b 11/06
U.S. Cl. 66—89 21 Claims

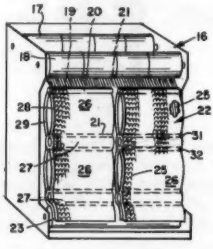


A method and means for loop doubling in straight bar rib to plain knitting machines wherein groups of loop transfer points are movable lengthwise relative to one another to effect spaced doublings throughout the knitting width of a garment piece.

3,656,323
TUBULAR FABRIC ARTICLE AND METHOD FOR MAKING SAME

Russell L. Brown, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Jan. 19, 1970, Ser. No. 3,618
Int. Cl. A41b 9/02
U.S. Cl. 66—177 7 Claims



A tubular article which may be a continuous web of successive flat, open-ended tubes of knitted fabric, or a single such open-ended tubular article cut along seam areas from such a web, for example, a tubular warp knitted garment, is provided with cross interlooped, narrow strips on each opposite side of each seam area, the strips being separated by a wider, tubular strip so that when severed from the web along the center line of the tubular strip, the resulting seam will appear to be of the flat, plain type. The narrowness of the cross interlooped strips avoids build-up of excessive yarn tension.

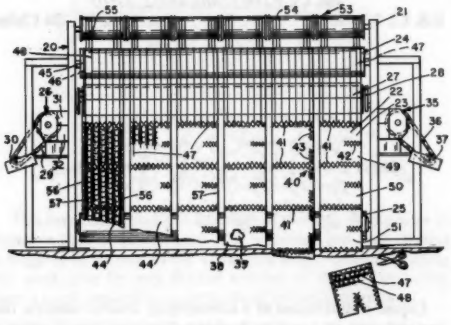
The open-ended tubular article is free of areas of excessive tension variance, especially along the seams, to produce the appearance of a uniform knitted structure throughout.

3,656,324

WARP KNITTED GARMENTS AND APPARATUS AND METHOD FOR MAKING THE SAME

George Edward Jackson, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 19, 1968, Ser. No. 776,938
Int. Cl. A41b *9/02*
U.S. Cl. 66—177 9 Claims



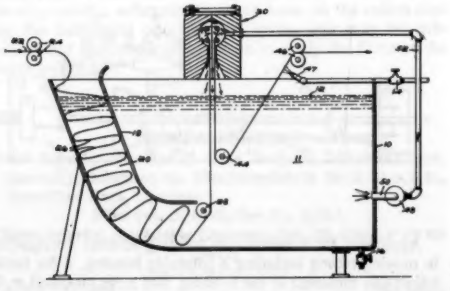
A double needle bar, warp knitting machine, of the Raschel type, produces a continuous, two ply web formed of two superposed, warp knit, single fabrics, cross interlooped along successive course-wise extending strips, spaced apart wale-wise, to form a succession of open ended, course-wise extending tubes. Stretchable-retractive yarns may be provided wale-wise of the tubes so that when the doubled web is severed into individual tubes and the tubes are turned through 90°, the stretchable yarn runs circumferentially of the tube to form a stretchable garment such as a girdle, panty brief, or the like.

3,656,325

APPARATUS FOR WET PROCESSING A CONTINUOUS LENGTH OF MOVING MATERIAL

Fritz Peter, Shrewsbury, Mass., assignor to Rodney Hunt Company, Orange, Mass.

Continuation of application Ser. No. 747,409, June 19, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 657,632, Aug. 1, 1967, now abandoned.
This application Sept. 4, 1970, Ser. No. 69,882
Int. Cl. B05c *3/05, 3/152, 3/176*
U.S. Cl. 68—3 SS 8 Claims



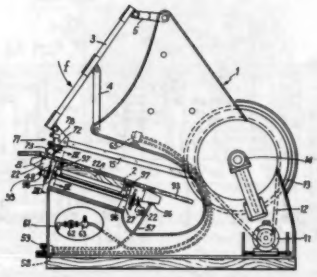
An apparatus for subjecting a continuous length of moving material to a fluid treatment. The material is initially soaked in a bath of processing fluid while in a substantially tensionless condition. Immediately thereafter, the material is guided through a treatment chamber where it is exposed to a high velocity flow of the same processing fluid.

3,656,326

LEATHER-SMOOTHING MACHINE

Yves Grenier, Residence Le Belvedere C4, Voiron, France

Filed Aug. 5, 1970, Ser. No. 61,279
Claims priority, application France, Sept. 5, 1969, 6930293
Int. Cl. C14b *1/36*
U.S. Cl. 69—46 5 Claims



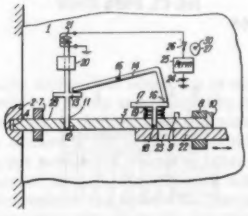
The machine for smoothing leather comprises a frame which supports a table for the reception of the leather to be smoothed and an oscillating arm articulated on levers and the free end of which carries a glass smoothing cylinder which describes a reciprocating movement against the table while the said arm oscillates under the action of a motor drive, in which the guide table is mounted on the frame through the intermediary of guide means which compel the table to move parallel with itself in a direction perpendicular to its own plane, while an inflatable bladder is interposed between the table and a support fast with the frame.

3,656,327

ELECTRICALLY OPERATED DOOR BOLT

Robert Brough Ford, Richmond, and Martin Herbert Lloyd, Addington, both of England, assignors to Iternational Standard Electric Corporation, New York, N.Y.

Filed Oct. 27, 1970, Ser. No. 84,390
Claims priority, application Great Britain, Nov. 25, 1969, 57,625/69
Int. Cl. E05b *47/06, 49/02*
U.S. Cl. 70—133 8 Claims



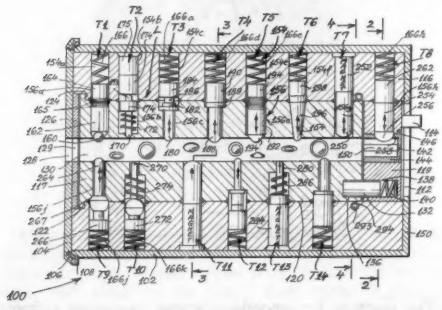
A solenoid-controlled door bolt locking mechanism designed for use in conjunction with a rotary permutation arrangement, in which a proper setting of a series of rotary multiconductor wafers comprising the permutation arrangement completes an electrical circuit which enables operation of the locking mechanism. The proper permutation setting

simultaneously causes a solenoid to retract a holding plunger, which rendered the door locking bolt immobile in the locked position, and the rotary control knob of the permutation arrangement to become mechanically coupled to the door locking bolt. A further rotation of the control knob, subsequent to a proper permutation setting, withdraws the locking bolt and, in reverse direction, locks it again.

3,656,328
LOCK ASSEMBLY

Benjamin F. Hughes, Route 1, P.O. Box 120, Morris, Ala.

Filed June 3, 1970, Ser. No. 42,944
Int. Cl. E05b *27/10*
U.S. Cl. 70—276 **18 Claims**

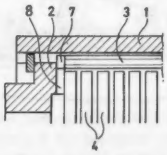


A lock assembly has a stationary barrel. A cylinder having one or more sections is rotatable in the barrel and defines a shear line. Tumbler assemblies in radial bores in the cylinder and barrel are radially and circumferentially spaced. Pins may have different sizes and shapes and may terminate in flat wafer edges exposed to an axial bore in the cylinder. The cylinder receives a key shaft formed with recesses arranged to correspond with the spacing of the tumbler assemblies. Key engaging means is provided at the inner end of the bore in the cylinder to engage an appropriately shaped end of the key shaft. The key shaft may be magnetized to attract magnetic pins of some tumbler assemblies radially into the bore. Radial bores may be countersunk; pins and pin drivers may be ridged and grooved; and spring means can bear tangentially on the cylinder to stabilize it, all to forestall picking of the lock assembly.

3,656,329
GUIDED LOCKING BAR

Into Sinervo, Helsinki, Finland, assignor to Oy Wartsila Ab, Helsinki, Finland

Filed Mar. 28, 1969, Ser. No. 811,366
Int. Cl. E05b *29/00*
U.S. Cl. 70—366 **5 Claims**

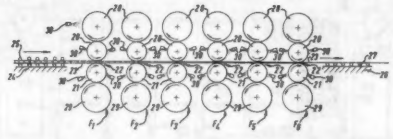


A cylinder lock comprises a cylinder housing enclosing a rotatable cylinder and an axially extending locking bar locking the cylinder with respect to the housing. The locking bar is straight and guided so that it is unable to rotate around its longitudinal axis.

3,656,330
SYSTEM FOR DISTRIBUTING LIQUID OVER A SURFACE

Thomas W. Brown, Didcot, and John S. Lemlin, Wantage, both of England, assignors to Esso Research and Engineering Company

Filed Feb. 20, 1970, Ser. No. 13,077
Claims priority, application Great Britain, Feb. 28, 1969, 10,778/69
Int. Cl. B21b *37/00, 45/02, 27/10*
U.S. Cl. 72—10 **26 Claims**

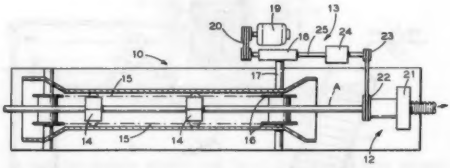


Liquid is distributed at a substantially desired uniform rate per unit area on a surface having a dimension which varies in a predetermined manner by projecting at the surface a divergent stream of the liquid from a nozzle which can be moved towards and away from the surface, the rate of supply of liquid to the nozzle being substantially proportional to the distance between the nozzle and the surface. The invention is useful in applying a wear-resisting liquid coating to the rolls of hot metal rolling stand, the chosen rate of discharge being sufficient to mitigate wear of the work rolls without derogating from their performance.

3,656,331
APPARATUS FOR PRODUCING ANNULAR CORRUGATED TUBING

Hubert Kuypers, Bad Nenndorf, and Friedrich Schatz, Langenhagen, both of Germany, assignors to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Mar. 26, 1970, Ser. No. 22,787
Claims priority, application Germany, Mar. 29, 1969, P 19 16 357.6
Int. Cl. B21d *15/06*
U.S. Cl. 72—77 **7 Claims**

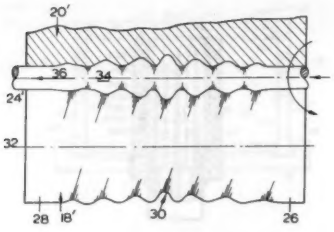


Apparatus for continuously forming annular corrugations in moving tubing including a rotatable housing, a die holder adjustably mounted in the housing, and a die mounted in the die holder, wherein the die comprises a ring-shaped member with a helical forming rib on the inner edge thereof.

3,656,332
METAL WORKING

Jacob Marcovitch, Johannesburg, Republic of South Africa, assignor to Rotary Profile Anstalt, Vaduz, Liechtenstein

Filed May 22, 1969, Ser. No. 826,816
Claims priority, application Republic of South Africa, May 27, 1968, 68/3369
Int. Cl. B21d 7/08; B21f 21/00
U.S. Cl. 72—77 4 Claims

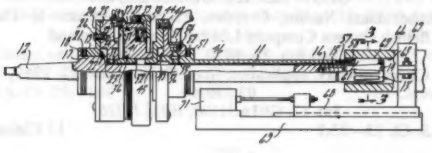


This invention relates to methods of working workpieces to improve their characteristics. The invention provides causing a bulge to be formed in the workpiece and to be moved along the workpiece for any desired number of times. The invention is most applicable to methods of rolling processes.

3,656,333
CYLINDRICAL SURFACE FINISHING TOOL

Clemens A. Kruse, Jr., 1718 Waverly, Ann Arbor, Mich.

Filed May 21, 1970, Ser. No. 39,246
Int. Cl. B24b 39/02; B21c 37/30
U.S. Cl. 72—122 8 Claims



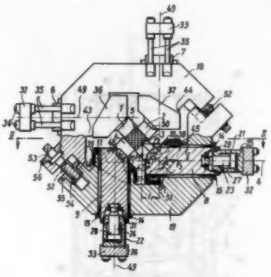
The tool of the burnishing type has a cage at the working end of a spindle containing tapered rollers that engage a diverging truncated conical head on the end of the spindle. The opposite end of the spindle has a driven end on which a nonrotatable pressure applying unit is disposed. In one form the unit is a cylinder having a piston therein which exerts pressure on the cage supporting tube and forces the truncated conical rollers downwardly over the conical head and thereby exerts a substantial outward force on the rollers during the burnishing operation. A spring unit may be substituted for the cylinder and piston to apply the force to the sleeve and rollers.

3,656,334
FORGING MACHINE

Horst Schenk, and Rudolf Guse, both of Dusseldorf-Rath, Germany, assignors to Maschinenfabrik Sack G.m.b.H., Dusseldorf-Rath, Germany

Filed Feb. 3, 1970, Ser. No. 8,284
Claims priority, application Germany, Feb. 20, 1969, P 19 08 361.5
Int. Cl. B21j 13/02
U.S. Cl. 72—399 5 Claims

A forging machine is disclosed for reducing the cross sectional area of a workpiece which is positioned on a forging axis of the machine, i.e. the direction of travel of the workpiece through the machine. At least three forging saddles are arranged at intervals around the forging axis for applying a lateral thrust generally towards the forging axis. Each forging

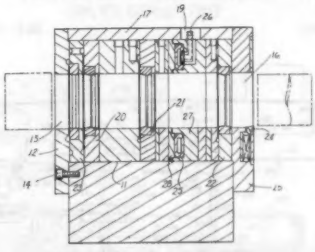


saddle has associated with it a driving mechanism for imparting a thrust to the saddle and an axially guided sliding plunger which transmits the thrust from the driving mechanism to the saddle and which has its axis inclined to the axis of the saddle.

3,656,335
WALL IRONING TOOL PACK

Elton G. Kaminski, Sidney, Ohio, assignor to The Strolle Corporation, Sidney, Ohio

Continuation-in-part of application Ser. No. 26,356, Apr. 7, 1970, now abandoned. This application June 24, 1970, Ser. No. 49,219
Int. Cl. B21d 22/28
U.S. Cl. 72—349 12 Claims

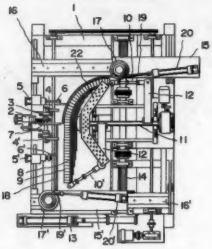


A wall ironing tool pack in which one or more ironing dies or rings are held in a holder and clamped by means of a pressure ring. In setting up, the tool pack components and a pressure ring are stacked in the desired relationship in a holder with the ring not pressurized. A can or other cylindrical object is wall ironed through the tool pack with just enough pressure in the pressure ring to hold the components in position while permitting slip along the interfaces thereof for alignment. When alignment has been achieved, pressure on the pressure ring is increased to retain the components in alignment with each other and with the punch. The pressure ring permits a change in the length of the tool pack caused by heating or cooling, while retaining the alignment of the pack.

3,656,336
APPARATUS FOR FORMING AND QUENCHING PLATE SPRINGS

Shozo Eguchi, 36, 2 Chome, Sakurayama-Cho, Showa-Ku, Nagoya-Shi, Japan

Filed May 1, 1969, Ser. No. 820,786
Int. Cl. B21d 7/10, 7/16
U.S. Cl. 72—397 2 Claims

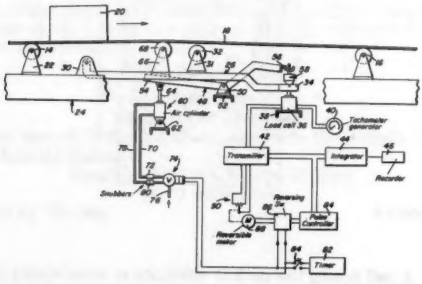


A spring forming and quenching apparatus in which an array of blocks in sliding contact relationship on a stack of leaf springs is deformed against a stationary member to provide a shaping surface for the hot workpiece which is fed by arms to this surface. A flexible wire, tensioned between a pair of sheaves, retains the workpiece against the surface while quenching liquid is sprayed from nozzles within the blocks and behind the wire against the spring from both sides thereof.

3,656,337
SCALE CALIBRATION CHECKING DEVICE

Ralph R. McDonald, Carlsban, N. Mex.

Filed Jan. 19, 1971, Ser. No. 107,734
Int. Cl. G01c 25/00; G01g 19/52, 23/00
U.S. Cl. 73—1 B 10 Claims

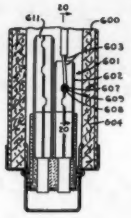


A pivoted scale beam type of weighing device senses the weight of articles traveling on a continuously moving conveyor belt. The conveyor belt is periodically displaced upwardly from the weighing device during test intervals to check calibration by simultaneously removing the load of the conveyor from the weighing device while transferring a reference weight thereto. The weighing device is automatically adjusted during each test interval if there is a deviation from a proper reference reading.

3,656,338
DEVICE AND METHOD FOR SAMPLING MOLTEN METAL

William J. Collins, 7005 Madison Street, Merrillville, Ind.

Continuation-in-part of application Ser. No. 38,700, May 19, 1970. This application Aug. 6, 1970, Ser. No. 61,625
Int. Cl. G01n 1/12, 25/04
U.S. Cl. 73—17 R 52 Claims

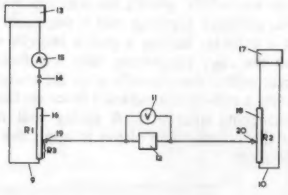


A molten metal sampling apparatus and method of the type in which a sample receiving means is positioned in the end of a cardboard tube intended to be dipped into a body of molten metal. The molten metal after disintegrating an external protective cap flows through a tortous path and divides into two passageways before solidifying in a receiving chamber to form a solid sample. One receiver in each sampling device is provided with a temperature measuring means so that the temperature changes of the sample may be measured.

3,656,339
GLOW DISCHARGE DETECTOR

Chandramani Narain, Croydon, England, assignor to The British Oxygen Company Limited, London, England

Filed Jan. 21, 1970, Ser. No. 4,580
Claims priority, application Great Britain, Jan. 22, 1969, 03,599/69
Int. Cl. G01n 31/08; H01j 17/26
U.S. Cl. 73—23.1 11 Claims



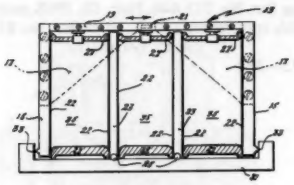
The invention relates to an electrical glow discharge detector for detecting small amounts of gaseous impurity in a gas, having a pair of electrodes in a fluid-tight chamber provided with a constant bore capillary tube inlet. The sensitivity of the detector is improved by applying across the electrodes a power source capable of both supplying a low, sensitive, discharge voltage and a high discharge starting voltage to restart the discharge if the sensitive voltage should permit it to fail.

3,656,340

CELL PRESSURE-SENSING BATTERY CASE

James V. Ball, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 22, 1970, Ser. No. 74,345
Int. Cl. G01b 7/18
U.S. Cl. 73—88.5 R 4 Claims



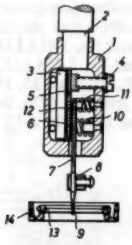
A pressure-sensing means for use with a battery case structure having a plurality of juxtaposed cells positioned therein. A strain gauge means is attached to one structural member of the battery case such that a pressure build-up in any one or more of the cells produces a corresponding tension force in the structural member thereby indicating the highest pressure developed in the cells.

3,656,341

METHOD AND APPARATUS FOR TESTING RESILIENT OBJECTS FOR FLAWS

Gunter Jansen, Bergisch-Neukirchen, and Hans Kling, Cologne-Lindenthal, Germany, assignors to Goetzewerke Friedrich Goetze AG, Burscheid, Germany

Continuation-in-part of application Ser. No. 651,459, July 6, 1967, now abandoned. This application Mar. 11, 1970, Ser. No. 18,613
Claims priority, application Germany, July 6, 1966, G47,360
Int. Cl. G01n 27/82
U.S. Cl. 73—104 16 Claims



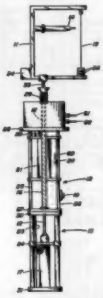
Flaws are located in the surface of a resilient material by moving a probe member across the surface and detecting variations in the position of the probe member which are caused by variations in friction between the probe member and the surface. The probe member is mechanically coupled to a piezoelectric transducer which translates variations of friction between the probe member and the resilient surface into variations of electrical potential. For testing shaft sealing rings, a pair of expansion rollers are mounted on either side of the probe member to radially expand the sealing ring where it is contacted by the probe member and therefore to enlarge any faults therein so that they will be easier to detect.

3,656,342

WATER WAVE FOLLOWER

Mart Peep, and Ronald J. Flower, both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed Dec. 9, 1970, Ser. No. 96,515
Int. Cl. G01w 1/00
U.S. Cl. 73—170 R 5 Claims



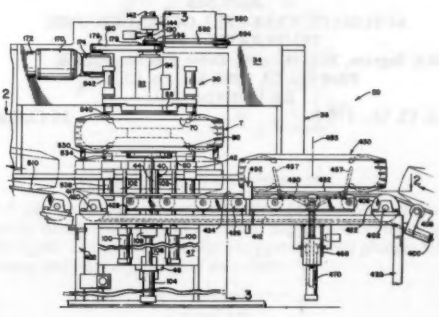
A hydraulically operated, electronically controlled servomechanism wave follower to hold anemometers at fixed distances above the water surface to measure the wind field close to the surface. A wave probe mounted on the wave follower senses the water level, relays this data to an electrical control network which operates on a servo valve, enabling hydraulic fluid to raise or lower the wave probe and anemometer to the desired height.

3,656,343

APPARATUS FOR PROCESSING CURED TIRES

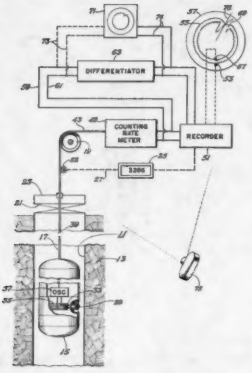
William D. Braden, Stow; Richard P. Marshall, Tallmadge; Richard J. Greenhorn, Stow, and Arnold S. Buser, Akron, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 2, 1970, Ser. No. 7,489
Int. Cl. G01m 17/02
U.S. Cl. 73—146 10 Claims



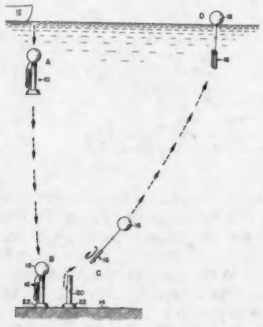
Apparatus for processing tires, in particular for discovering anomalies therein comprising means for chucking, inflating, and rotating a tire thereon about a vertical axis, means for operating on the tire chucked by moving a load roll to apply a radial load to the tire. The roll is mounted on a deflectable yoke secured on a carriage movable to and away from the tire. Means supporting the tire first prelocates and centers the tire, then moves the tire into coaxial registry with the chucking means.

3,656,344
LOGGING RADIAL TEMPERATURE DISTRIBUTION WITHIN A WALL
Earl Johns, Fort Worth, Tex., assignor to Gearhart-Owen Industries, Inc., Fort Worth, Tex.
Filed Nov. 20, 1970, Ser. No. 91,294
Int. Cl. E21b *47/024, 47/06*
U.S. Cl. 73—154 **21 Claims**



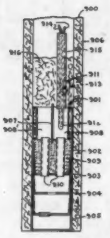
Method of and apparatus for logging temperature in a well bore penetrating subterranean formations characterized by rotating a directional temperature sensor radially about the longitudinal axis of a temperature logging tool traversing the well bore; and displaying and recording a function representative of the temperature distribution sensed by the temperature sensor as it is rotated radially. Also disclosed are specific and preferred embodiments in which a direction indicating means is incorporated into the system to indicate the direction of anomalies sensed by the temperature sensor; the function is differentiated to produce a differential function of increased sensitivity which is also displayed; and the logging tool is simultaneously traversed while the temperature sensor is being rotated to effect a log of a greater interval of the well bore.

3,656,345
AUTOMATIC FREE-FALL OCEANOGRAPHIC TEMPERATURE PROBE
Carey Ingram, 3634 Oleander Drive, San Diego, Calif.
Filed Oct. 23, 1970, Ser. No. 83,570
Int. Cl. G01w *1/00*
U.S. Cl. 73—170 R **10 Claims**



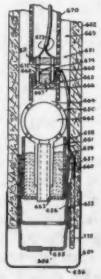
An oceanographic temperature probe which can be jettisoned from vessels at sea for free-fall descent to a desired water depth on the ocean floor. After a predetermined lapse of time a float is released from a disposable stand which causes the operation of a reversing thermometer and its return to the surface with the float for recovery.

3,656,346
DEVICE AND METHOD FOR SAMPLING MOLTEN METAL
William J. Collins, 7005 Madison Street, Merrillville, Ind.
Continuation-in-part of application Ser. No. 810,230, Mar. 25, 1969, now abandoned, which is a continuation-in-part of application Ser. No. 713,640, Mar. 18, 1968, now abandoned. This application Aug. 5, 1970, Ser. No. 61,257
Int. Cl. G01n *1/12*
U.S. Cl. 73—354 **18 Claims**



A molten metal sampling device of the type incorporated in the end of a cardboard manipulating tube. A series of nested and perforated cups provide a tortuous entrance through a lower chamber passageway. A receiving chamber communicates with the lower chamber via a pair of passageways. In one embodiment the receiving chamber is divided by a partition into two secondary chambers. A thermocouple may be fixed in one of these secondary chambers to monitor the cooling of the metal sample as it solidifies.

3,656,347
DEVICE AND METHOD FOR SAMPLING MOLTEN METAL
William J. Collins, 7005 Madison Street, Merrillville, Ind.
Continuation-in-part of application Ser. No. 713,640, Mar. 18, 1968, which is a continuation-in-part of application Ser. No. 391,654, Aug. 24, 1964, now abandoned, and 590,829, Oct. 31, 1966, now Patent No. 3,415,124, and 649,764, May 12, 1967, now Patent No. 3,415,125, Continuation of application Ser. No. 810,287, Mar. 25, 1969, now abandoned. This application June 24, 1970, Ser. No. 49,576
Int. Cl. G01n *1/12*
U.S. Cl. 73—354 **28 Claims**



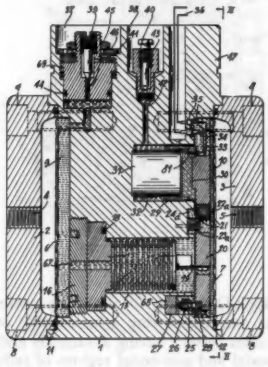
The invention involves utilizing a device which is adapted to be dipped into a bath of molten metal for obtaining a sample and the temperature thereof for analysis.

3,656,348

PRESSURE MEASURING DEVICES OF THE ELECTRICAL COUNTERBALANCING FORCE BALANCE TYPE

Pierre Claude Bertrand, Pau-Billere, France, assignor to Compagnie des Compteurs, Paris, France

Filed July 28, 1970, Ser. No. 58,802
Claims priority, application France, Aug. 11, 1969, 6927550
Int. Cl. G01l 9/10
U.S. Cl. 73—398 R 7 Claims



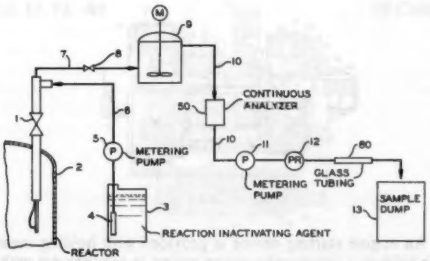
The improvements brought to force balance pressure measuring devices include a measurement unit, a measurement bellows, two flexible diaphragms, a liquid filling the interval between the diaphragms and an electrical force balance set into a proof chamber.

3,656,349

REACTION CONTROL AND SAMPLING APPARATUS

Henry R. Collins, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company

Original application Mar. 22, 1965, Ser. No. 441,675, now abandoned. Divided and this application Aug. 25, 1969, Ser. No. 870,747
Int. Cl. G01n 1/14
U.S. Cl. 73—421 B 5 Claims



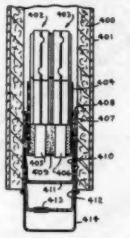
A sampling system including sample probes for withdrawing and inactivating samples obtained from a reacting mixture with a reaction inactivating agent includes means for injecting inactivating agent into the sample during withdrawal without injecting inactivating agent into the reactor itself.

3,656,350

DEVICE FOR SAMPLING MOLTEN METAL

William J. Collins, 7005 Madison Street, Merrillville, Ind.

Continuation-in-part of application Ser. No. 713,640, Mar. 18, 1968, now abandoned. This application May 19, 1970, Ser. No. 38,700
Int. Cl. G01n 1/12
U.S. Cl. 73—425.4 R 47 Claims



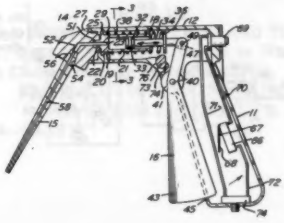
A molten metal sampling apparatus and method of the type in which a sample receiving means is positioned in the end of a cardboard tube intended to be dipped into a body of molten metal. The molten metal after disintegrating an external protective cap flows through a tortous path and divides into two passageways before solidifying in a receiving chamber to form a solid sample.

3,656,351

PIPETTE

Earl F. Raczak, Southampton, Pa., assignor to Bio/Data Corporation, Norristown, Pa.

Filed June 25, 1970, Ser. No. 49,685
Int. Cl. G01n 1/14
U.S. Cl. 73—425.6 3 Claims



A pipette having a piston grip with a downwardly and outwardly directed nozzle to be inserted into a vessel containing the liquid. The pipette includes a trigger-actuated plunger for raising and discharging liquid therefrom.

3,656,352

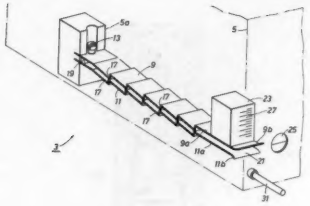
IMPACT MONITORING APPARATUS

George M. Low, Acting Administrator of the National Aeronautics and Space Administration in respect to an invention of, and Leland O. Mortensen, 1465 B. North Glaseli, Orange, Calif.

Filed Dec. 2, 1970, Ser. No. 94,374
Int. Cl. G01p 15/04
U.S. Cl. 73—492 10 Claims

An impact monitoring apparatus for indicating and recording the magnitude of force imposed in a specific direction on

a particular axis of interest comprising two parallel saw-tooth leaf springs mounted in cantilever fashion one above the other. The upper leaf spring supports at its free end a designated mass. Upon experiencing a force or shock along the axis of interest the free ends of the springs are deflected



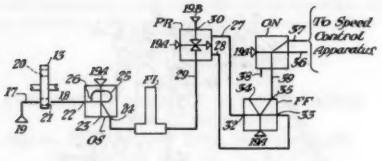
so that the saw-tooth portions thereof mechanically engage and lock into one another. Movement of the upper spring is amplified by the mass thereon. Engagement of the springs occurs along a length from the free end, the extent of engagement being proportional to the magnitude of the force experienced.

3,656,353

VEHICLE SPEED SENSOR

Edward H. Bell, Hunterdon County, N.J., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Dec. 8, 1969, Ser. No. 882,873
Int. Cl. G01p *3/26*
U.S. Cl. 73—493 **3 Claims**



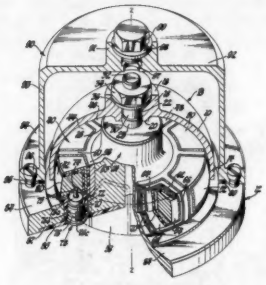
Vehicle speed sensing apparatus in which vehicle movement is first translated into rotary motion by a sprocket wheel and chain arrangement which is engaged by the moving vehicle. A pressurized fluidic stream, specifically air, is pulsed by passage through slots in one sprocket wheel. The resulting fluid pulses are received by a collector tube and fed into a fluidic one-shot multivibrator unit for shaping into a succession of uniform duration pulses whose frequency varies directly in response to the varying speed of the vehicle. These pulses are converted into a time average pressure signal which is compared with a preselected bias pressure representative of a desired vehicle speed. The proportional output of this comparison actuates a fluidic flip-flop unit to its first or second condition as the vehicle speed is greater or less than, respectively, the desired speed. A first condition signal from the flip-flop actuates an OR-NOR gate to its OR condition and the resulting output signal may be used to actuate other apparatus to control the vehicle speed.

3,656,354

BELL GYRO AND IMPROVED MEANS FOR OPERATING SAME

David D. Lynch, Greendale, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 6, 1969, Ser. No. 864,019
Int. Cl. G01c *19/56*
U.S. Cl. 73—505 **10 Claims**



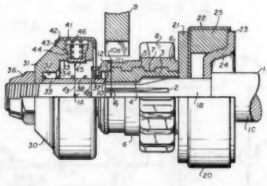
A bell-like high-Q member for detecting motion of a platform about an axis and having a lip capable of sustaining therein a vibration pattern having alternately and equi-angularly spaced nodal and anti-nodal regions of radial vibration when the lip is exercised radially. Pickoff electrodes located at regions nodal in the absence of rotation about the axis detect radial vibrations developed thereat due to the effects on the vibrations pattern of the rotation about the axis. Forcer electrodes located at other regions nodal in the absence of rotation are connected in circuit with the pickoff electrodes to null such radial vibrations.

3,656,355

ENGINE STARTER HAVING MEANS FOR HOLDING SAME IN A CRANKING POSITION

Tsuyoshi Matsumoto, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 26, 1970, Ser. No. 22,994
Claims priority, application Japan, Mar. 28, 1969, 44/27646
Int. Cl. F02n *15/06*
U.S. Cl. 74—7 B **9 Claims**

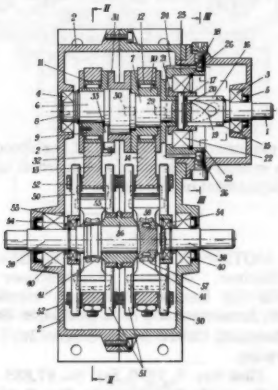


An engine starting device is provided with holding means for holding a rotationally driven pinion in engagement with a ring gear of the engine to be started. The holding means comprises a translatable and rotatable barrel member having connected thereto the pinion and a pawl. A detent is slidably mounted in a radial extending hole provided in a fixed support member and cooperates with the pawl to maintain the pinion in mesh with the engine ring gear until the engine is started.

3,656,356
CONTINUOUS GEAR-TYPE SPEED VARIATOR

Lino Gubbiotti, Perugia, Italy, assignor to Italvariatori Perugia S.r.l., Perugia, Italy

Filed Apr. 17, 1970, Ser. No. 29,603
Claims priority, application Italy, Apr. 24, 1969, 32,509 A/69; Apr. 3, 1970, 49,741A/70
Int. Cl. F16h 21/12, 29/04
U.S. Cl. 74—63 16 Claims

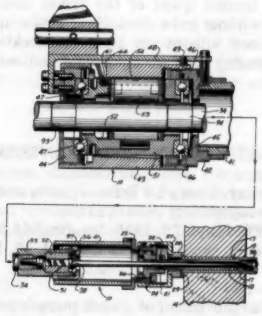


A continuous gear-type speed variator characterized in comprising eccentric means for transforming the rotational movement of the input shaft into a reciprocational movement having a continuously variable amplitude, means participating of said reciprocating movement and carrying on each side of the driven shaft at least one endless screw, at least one helical gear ring rigid with the driven shaft, always engaged with the two endless screws, and means for rendering said endless screws alternately rigid with said reciprocating means so as to drive said gear ring like a rack in the stroke towards a direction of said reciprocating means, and capable of rotating, so as to passively follow the movement of said gear ring in the stroke towards the opposite direction of said reciprocating means.

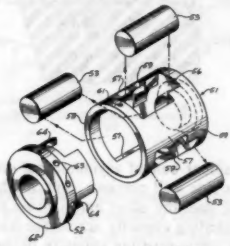
3,656,357
SHAFT FEEDING APPARATUS

Harry L. Corwin, 3341 Wood Terrace, Los Angeles, Calif.

Filed Dec. 29, 1969, Ser. No. 888,600
Int. Cl. F16h 27/02
U.S. Cl. 74—89 10 Claims



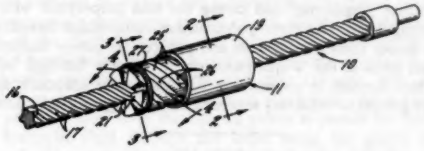
An apparatus particularly useful for expanding ends of tubing for attachment to a tube sheet or the like is described. A conventional tube expander comprising a hollow cage with swaging rollers fits within the tube and a rotating tapered mandrel within the expander cage causes the cage and rollers to rotate and also spreads the rollers radially against the tube wall as the mandrel advances, thereby enlarging the portion of tubing adjacent the rollers. The mandrel is connected to a rotatable cylindrical shaft that is surrounded by a plurality of drive rollers having their axes skewed relative to the shaft axis, and contained within a fixed housing for slowly advancing the shaft in response to its rotation and withdrawing the shaft when direction of rotation is reversed. A retainer cage and a sleeve engage opposite ends of the drive rollers and are relatively movable for adjusting the skew angle of the drive rollers for adjusting the axial feed rate of the shaft and mandrel. The housing has a tapered inside surface for adjusting the clearance between the shaft and housing within which the drive rollers fit for accommodating manufacturing tolerances and wear. A torque limiting or sensing mechanism between the tube expanding apparatus and a motor means for rotating the shaft, reverses the motor rotation when the tube is properly expanded for automatic withdrawal.



3,656,358
LINEAR POSITIONING DEVICES AND THE LIKE

Norman L. Kopp, Beloit, Wis., assignor to Warner Electric Brake & Clutch Company, South Beloit, Wis.

Filed May 19, 1970, Ser. No. 38,792
Int. Cl. F16h 27/02, 29/02
U.S. Cl. 74—89.15 8 Claims



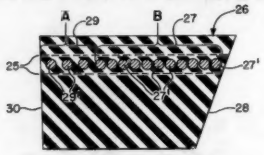
A collar telescoped over and adapted to be translated back and forth relative to an elongated rod includes cantilevered fingers which are resiliently wedged into angularly spaced grooves formed in the rod to preload the collar onto the rod and to prevent rotational play from developing between the two. In one embodiment, the collar is telescoped onto a rod in the form of a splined shaft while, in another embodiment, the collar is a nut which is threaded onto a screw with multiple threads.

3,656,359

ASYMMETRIC BELT CONSTRUCTION

Marvin L. Dorf, and Leo C. Barnell, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 21, 1970, Ser. No. 99,950
Int. Cl. F16g 5/00, 1/22; F16h 55/22
U.S. Cl. 74—234 18 Claims



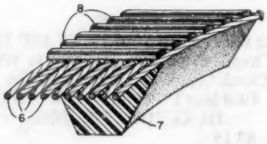
A flexible, resilient belt of asymmetrical cross-section including opposite side wall portions, one of which is inclined at a larger angle than the other and a stress zone having an unequal stress-resisting capacity across the width of the belt with the greater stress-resisting capacity being concentrated in the area of the stress zone adjacent to the side wall portion having the larger angle. The belt is particularly useful in variable speed V-belt drives.

3,656,360

POLYURETHANE BELTS

Sidney R. Fix, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of application Ser. No. 722,917, Apr. 22, 1968, now abandoned. This application Jan. 17, 1969, Ser. No. 805,925
Int. Cl. F16g 5/14
U.S. Cl. 74—234 7 Claims



A cured polyurethane composition prepared by mixing a particulate polyfluorohydrocarbon resin with a liquid polyurethane prepolymer and curing the said prepolymer with a curing agent. The cured polyurethane composition has utility in power transmission belts and particularly power transmission belts of the V-type, and other relatively flat-type belts which operate in conjunction with pulleys or sprockets and are subject to relatively severe flexing during their operation.

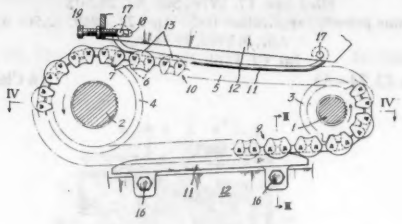
3,656,361

SILENT CHAIN-TRANSMISSION APPARATUS

Shoichi Honda, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 28, 1970, Ser. No. 58,964
Claims priority, application Japan, July 29, 1969, 44/59319
Int. Cl. F16h 7/18; F16g 13/02
U.S. Cl. 74—240 9 Claims

A silent chain drivingly couples the sprockets on two spaced transmission shafts. The chain includes teeth for engaging the sprockets and link plates which straddle the sprockets. Guide rails are provided between the sprockets and either the rails or the link plates have portions which permit longitudinal displacement of the chain while preventing lateral movement thereof. One of the sprockets can be provided in splined engagement with its shaft to provide for automatic adjustment of its position.

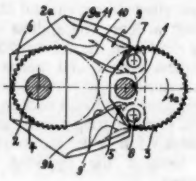


3,656,362

MOTION-CONVERTING GEARING

Hans Buchsteiner, deceased, Lindenstrasse 16, 7344 Gingen/Fils (by Renate Buchsteiner, executrix); Bruno Bernhardt, Jurastrasse 47, 7411 Reutlingen-Betzingen, and Hubert Kowalski, Untere Schloss-Strasse 36, 7071 Alfdorf, all of Germany

Filed Nov. 9, 1970, Ser. No. 87,885
Claims priority, application Germany, Nov. 8, 1969, P 19 56 250.6
Int. Cl. F16h 35/02
U.S. Cl. 74—393 6 Claims



A gearing for converting a constant rotation of its drive shaft to an intermittent rotation of its driven shaft, in which the driven shaft may be stopped and positively locked during each complete revolution of the drive shaft for any predetermined period which may last from a momentary stop to one amounting to a considerable angular distance of each revolution of the drive shaft. The transition from the stopped position to the normal speed of the driven shaft occurs very gradual and without jerks, the locking action upon the driven shaft is attained without any additional locking means, and the entire gearing is of a very simple and inexpensive construction.

3,656,363

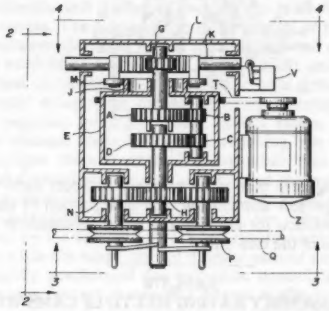
APPARATUS FOR PRODUCING INTERMITTENT MOTION

Paul Defontenay, Gourg La Reine, France, assignor to Redex Societe Anonyme, Ivry (Seine), France

Filed Sept. 29, 1969, Ser. No. 861,809
Claims priority, application France, Sept. 30, 1968, 168224
Int. Cl. F16h 35/02
U.S. Cl. 74—394 7 Claims

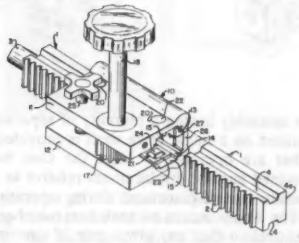
Intermittent movement of a work piece is produced from a rotary motor which drives the case of a differential. A cam integral with the differential case drives a gear rack slider

having a pinion which drives one sun gear of the differential. Another sun gear of the differential is coupled to the first sun gear by planet gears. Output drive rollers are gear driven



from the shaft of the second sun gear. A switch actuated by the slider may be employed to control an external machine or to control the operation of the motion producer itself.

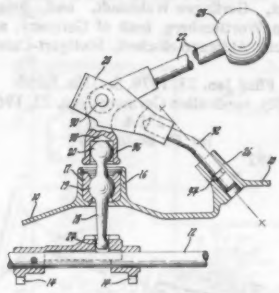
3,656,364
RACK AND HOLDER
H. Edward Cable, Thornburg, and John A. Cable, Moon Township, both of Allegheny County, Pa., assignors to Weld Tooling Corporation
Filed Dec. 2, 1970, Ser. No. 94,388
Int. Cl. F16h *1/04*
U.S. Cl. 74—422 **2 Claims**



An improved rack and rack holder for cutting and welding torches, etc. wherein the rack includes a pair of tapered grooves throughout its length and the rack includes a pair of tapered elements cooperatively engaging said grooves.

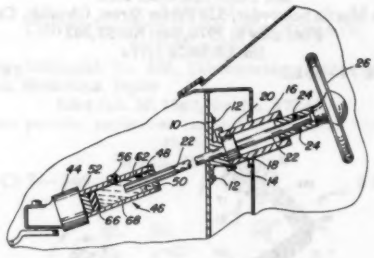
3,656,365
GEARSHIFT CONTROL ARRANGEMENT
Lutz W. Kussmann, Russelsheim, Hesse, Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 19, 1970, Ser. No. 90,954
Claims priority, application Germany, Jan. 13, 1970, P 20 01 261.7
Int. Cl. G05g *9/02*
U.S. Cl. 74—473 P **3 Claims**

A manual shift arrangement including a gearshift lever pivotally mounted on a pin and having a cup-shaped lower extremity, a connector lever having spherical ends and an intermediate spherical portion universally pivotally mounted in a dome portion of a conventional gearbox, one spherical end extending from the gearbox into the cup-shaped extremity and the other spherical end extending into the gearbox for



pivotal engagement with conventional shift forks, and a rotatably mounted bent rod member connected by a yoke to the shift lever adjacent the pin to provide transverse pivotal movement of the gearshift lever.

3,656,366
COLLAPSIBLE STEERING COLUMN
Leonard A. Somero, Thayer Road, New Ipswich, N.H.
Filed Feb. 1, 1971, Ser. No. 111,179
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **4 Claims**



A collapsible steering column for connecting an automotive steering wheel with the automotive steering actuating mechanism includes a cylindrical shaft having the steering wheel attached at one end and a disengageable support bearing engaging a transverse groove on the shaft. The opposite end of the shaft is formed into a hexagonal cross section which is positioned through a mating hexagonal opening in a hydraulic cylinder. Within the hydraulic cylinder, and attached to the end of the shaft there is a hydraulic piston having pressure relief holes through the piston to permit the flow of hydraulic fluid through the holes when the piston is moved. The opposite end of the hydraulic cylinder is operably attached to the steering actuating mechanism of the automobile so that rotational movement of the steering wheel, shaft and cylinder is converted by the steering actuating mechanism to impart steering force to the linkage attached to the front wheels of the automobile. When a predetermined force is applied to the steering wheel in a direction essentially parallel to the shaft, the disengageable support bearing disengages from the transverse groove on the shaft permitting the shaft and steering wheel to slide away from the driver. The hydraulic cylinder and piston act as a

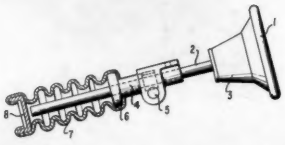
cushioning shock absorber as the shaft and piston slide through the cylinder.

3,656,367

SAFETY STEERING FOR MOTOR VEHICLES

Karl Wilfret, Gerlingen-Waldstadt, and Bela Barenyi, Maichingen Wurttemberg, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Jan. 23, 1970, Ser. No. 5,288
Claims priority, application Germany, Jan. 23, 1969, P 19 03 255.4
Int. Cl. B62d *1/18*
U.S. Cl. 74—492 **10 Claims**



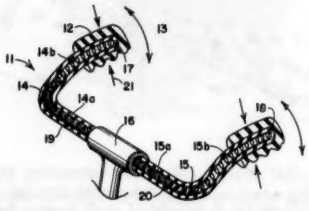
A safety steering for motor vehicles in which the steering spindle together with the outer steering column is able to pivot about a vehicle cross-axis under the influence of a force that exceeds the force acting on the steering wheel during normal operation; a plastically deformable deformation member is secured at the lower end of the outer column which in case of an impact of the driver against the steering wheel, is extended by the steering spindle projecting out of the outer column.

3,656,368

BICYCLE HANDLE BAR

Joseph Martin Schroeder, 520 Porter Street, Glendale, Calif.

Filed July 6, 1970, Ser. No. 52,242
Int. Cl. B62k *21/14*
U.S. Cl. 74—551.3 **1 Claim**



A bicycle handle bar comprises resilient material such that it may be flexed up and down by a rider so that the rider will exercise his arms as well as his legs when riding the bicycle.

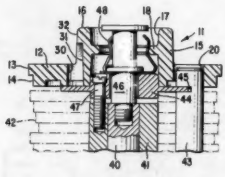
3,656,369

REPLACEABLE PATTERN CAM FOR SEWING MACHINES

James W. Momberg, Somerville, N.J., assignor to The Singer Company, New York, N.Y.

Filed Jan. 6, 1971, Ser. No. 104,407
Int. Cl. F16h *53/00*
U.S. Cl. 74—567 **2 Claims**

An exchangeable sewing machine pattern cam unit including a cam disk portion and having a raised hub providing a finger grip. The unit is fabricated in a two-part mold separable axially of the pattern cam disk. The raised hub is formed with a plurality of radial indentations which terminate short of the upper extremity of the hub leaving segmented lips which enhance the operator's grip on the cam unit hub. This advantageous cam hub formation is attained by the method



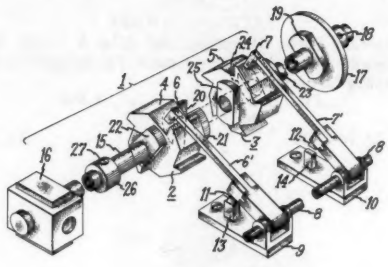
of providing core pins in an ordinary two-part mold which core pins project through the cam disk portion of the cam unit into position for defining the radial indentations in the hub portion of the cam unit.

3,656,370

CAM ASSEMBLY HAVING MULTIPLE CAMS WITH INTEGRAL CAM POSITIONING MEANS THEREON

Austin F. Wilson, Rochester, N.H., assignor to General Electric Company

Filed July 2, 1970, Ser. No. 52,019
Int. Cl. F16h *54/04*
U.S. Cl. 74—568 R **8 Claims**



A cam assembly having a plurality of separate cam members mounted on a single drive shaft is provided with detent means that are operable to align the cam members in a predetermined angular displacement relative to one another, and maintain that displacement during operation of the assembly. The detent means on each cam member are substantially identical so that any given pair of cam members or a suitably mated replacement cam member may be operatively interlocked in the desired predetermined angularly displaced relationship without requiring further alignment procedures. In one embodiment of the invention, a unique cam-shift member is provided for readily changing the relative angular displacement between adjacent cam members without requiring these members to be removed from a drive mechanism on which they are mounted.

3,656,371

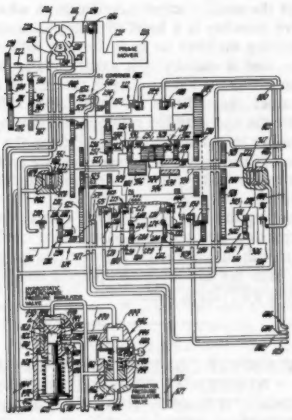
POWER TRAIN CONTROL SYSTEM

Robert H. Schaefer, Westfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Original application Nov. 27, 1968, Ser. No. 779,502. Divided and this application Aug. 3, 1970, Ser. No. 60,315
Int. Cl. F16h *47/08*; B60k *21/02*
U.S. Cl. 74—645 **3 Claims**

A control system is shown for a multispeed forward and reverse track-laying vehicle power train, the control system

having a manual forward and reverse control for effecting manual shifts between forward and reverse, a manual drive range control and an automatic drive range control for effecting manual and automatic drive range shifting operation and a steering control for effecting steering operation. The manual forward and reverse control provides selection between forward and reverse drive in the lowest drive range and prevents such shifting by the operator in all of the higher drive ranges. The manual drive range control provides selection between the drive ranges with the selected drive range being established immediately on an upshift and by speed governed automatic shifting operation on a downshift. The automatic drive range control provides automatic shifting using separate speed controlled upshift biases, an engine torque demand controlled upshift inhibiting bias and an engine torque demand controlled downshift bias. Both the manual forward and reverse control and the manual drive range control are electrically activated and in the event there is an interruption in electrical power, the directional drive selected by the manual forward and reverse control is maintained while the range control if under manual control is automatically conditioned for automatic control to maintain power train control. A sequence control is effective to disengage the range drive to the load in the lowest drive range during shifting between forward and reverse to provide for engagement of the directional drive under no-load conditions. The steer control operates on a hydrostatic unit to control steering by controlling hydrostatic pump displacement while assuring straight vehicle no-drift motion when there is no steer demand. The controlling force effecting this pump displacement control is varied according to hydrostatic pump output to meet the varying steer load demands in both directions of steer. There is also provided a stroke or pump displacement limiter for limiting pump displacement regardless of the steer demanded by the operator to prevent pump overload. Hydrostatic system pressure is controlled by a pressure relief control in accordance with engine torque demand and vehicle speed to both prevent overloading of the hydrostatic pump and limit the degree of steer bias. The steer control signals the range control to inhibit automatic range shifting during steering operation. The hydrodynamic torque converter in the power train has a lockup drive which is normally disengaged on range shifting and is held engaged during low speed operation in each range to provide for utilization of vehicle momentum to provide power for steering while preventing engine stall.

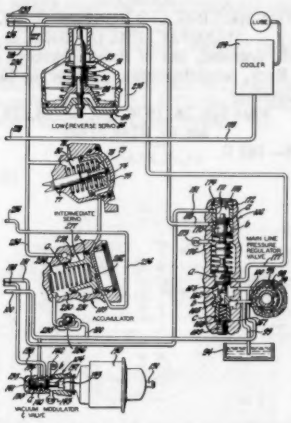


3,656,372

TRANSMISSION CONTROL

Howard E. Chana, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 8, 1970, Ser. No. 44,247
Int. Cl. B60k *21/02*; **F16d** *67/04*
U.S. Cl. 74—869 **3 Claims**



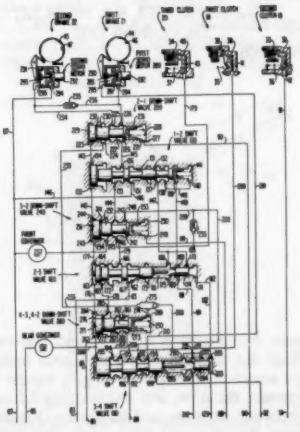
An automatic transmission control having a single accumulator with a single piston for smoothing the establishment of a plurality of transmission drives.

3,656,373

CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION

Tetsuo Shimosaki, No. 556, Shimomachiya, Kabe-cho, Asa-gun, Shiroshima, Japan

Filed Oct. 30, 1969, Ser. No. 872,627
Claims priority, application Japan, Oct. 31, 1968, 43/79508; 43/79511
Int. Cl. B60k *21/02*
U.S. Cl. 74—869 **3 Claims**



A control system for an automatic transmission for an automotive vehicle having a drive shaft, a driven shaft, means

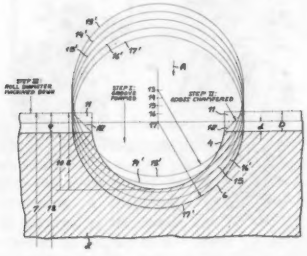
for providing low, intermediate, and high speeds between said shafts and including a plurality of friction members, a fluid source for supplying a fluid pressure to said respective friction members, a high speed shift valve, a low speed shift valve, and a timing valve. This control system provides a high efficiency control of the down-shifts of the transmission.

3,656,374

METHOD OF MILLING AND HOBBING ROLLS FOR THE MANUFACTURE OF RODS

Ernst Bock, deceased, late of Peine, Germany (by said Ingeborg Bock, administratrix), assignor to Ilseder Hutte, Peine, Germany

Filed Feb. 26, 1970, Ser. No. 14,518
Int. Cl. B21k *21/00*
U.S. Cl. 76—101 R **7 Claims**



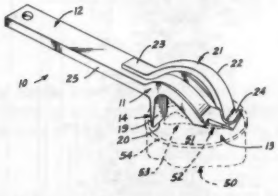
A deep circumferential groove is formed around a roll. The edges of this groove are chamfered, and threading formations are hob milled into the base and walls of the groove so that the mill teeth are not chipped away by impact with sharp edges of the groove. Thereafter the roll is machined down to eliminate the chamfers and reduce the diameter to the desired size. The thread-like formations in the groove of the rolls produce concrete reinforcement and like rods with helical thread-like ribs.

3,656,375

OPENER

Joe A. Reed, 515 East 10th Street, and John D. Reed, 123 Womack, both of Borger, Tex.

Filed May 4, 1970, Ser. No. 34,337
Int. Cl. B67b *7/00*
U.S. Cl. 81—3.46 **3 Claims**



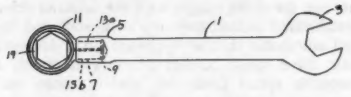
An opener for removing the ring and tear-away closure element from the top of a can. The opener includes a nose portion for insertion through the ring, a handle or gripping portion opposite the nose, and a depending fulcrum member disposed between the nose and handle so that the nose portion engages the ring and tears away the closure as the opener is rotated about the fulcrum. A retaining member is provided on the opener to catch and retain the ring and closure element after removal from the can.

3,656,376

FRICTION CLUTCH DEVICE

Theodore A. Campbell; Marlin R. Stebbins, and Jonathan W. Peelle, all of Colorado Springs, Colo., assignors to Rotoloc Corporation, Colorado Springs, Colo.

Filed Mar. 26, 1970, Ser. No. 22,887
Int. Cl. B25b *13/00;* **F16d** *11/06*
U.S. Cl. 81—58 **15 Claims**



A clutch device includes a cylindrical driven member surrounded by an annular driving member formed with a radial arm, the driving member being radially split along the axis of the arm. The arm extends into a cavity in an actuating member of the same width as the expanded arm whereby, by moving the actuating member to a position wherein the axis of the cavity is disaligned from the axis of the arm, the arm and the annular member will be compressed at their juncture to cause the annular member to frictionally grip the driven member. The clutch is embodied in a ratchet-action wrench in place of the usual ratchet mechanism in which the cylindrical drive member is a head rotatably mounted within an annular driving member or body formed with an elongated radial arm, and is radially split axially of the arm. The arm fits into an elongated axial cavity in the end of an elongated shank member, the width of the cavity being sufficient to accommodate the arm with the split open so that by moving the shank member to a position disaligned from the arm, the opposite side of the cavity will engage opposite ends of the arm, compressing the body to close the split and frictionally engage the head.

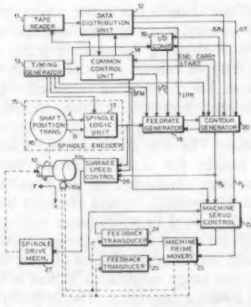
For retaining the arm in the shank cavity, the extremities of the expanded arm and the base of the cavity are wider than the mouth of the cavity, and for retaining the head in the body, both are formed with opposed annular grooves in which a split wire ring is seated.

3,656,377

SURFACE SPEED CONTROL OF SPINDLE-RELATED NUMERICAL CONTROL SYSTEM

Marion Kosem, Willoughby Hills, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed July 10, 1969, Ser. No. 840,641
Int. Cl. B23b *1/00*
U.S. Cl. 82—1 C **4 Claims**



In a numerical control system having apparatus for controlling feedrate as a function of spindle speed (angular velocity), a spindle encoder provides a train of basic feed

pulses at a frequency f_o as a function of spindle speed. Surface speed of a cutting tool over a workpiece is controlled to a value programmed in linear units where the spindle provides relative rotary motion between the tool and the workpiece by multiplying the frequency f_o by the absolute command position of the tool along an axis perpendicular to the axis of rotation of the spindle, and comparing the resulting product with a train of pulses at a frequency that is a function of programmed surface speed. Any difference drives a bidirectional counter in a direction corresponding to the sign of the difference. A digital-to-analog converter couples the output of the bidirectional counter to a spindle drive mechanism to bring the actual surface speed into agreement with the desired surface speed.

3,656,378

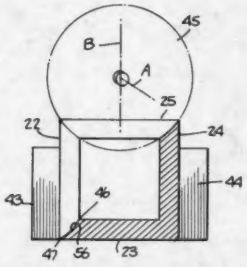
METHOD OF MANUFACTURE

Ariel R. Davis, P.O. Box 61, New Holland, Pa.

Original application Nov. 12, 1968, Ser. No. 784,979, now abandoned. Divided and this application Dec. 17, 1970, Ser. No. 99,110

Int. Cl. B23d *45/00*

U.S. Cl. 83—1 **10 Claims**



A tubular aluminum member is extruded in a rectangular shape and cut to a given length. The four walls of the tubular member are successively cut by a circular saw to form a portion of the tubular member into a generally spiral shape winding with terminal portions at each end. The member is treated to form an insulating layer on the surfaces of the member including the facing sides of the winding to form an inductive winding for passing current. The winding may be compressed and one set of edges treated for engagement by current taps to produce a variable voltage and current device.

3,656,379

METHODS OF CUTTING LAMINATED STRIP MATERIAL

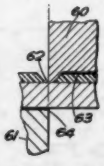
Martin Ronald Newton Clark, Ickenham, England, assignor to Vandervell Products Limited, London, England

Filed July 20, 1970, Ser. No. 56,286

Claims priority, application Great Britain, Oct. 22, 1969, 51,835/69

Int. Cl. B26d *3/06, 9/00*

U.S. Cl. 83—5 **5 Claims**



A method of cutting a laminated strip of material having soft and hard layers in which a groove is cut in the soft layer up to the hard layer and the hard layer is cut through in a plane between the sidewalls of the groove. The width of the groove is sufficient to avoid distortion of the hard layer caused by cutting of the hard layer from reaching the interfaces between the soft and hard layers on either side of the groove.

3,656,380

CUTTING PRESS HAVING IMPROVED MEANS FOR HANDLING CUT PRODUCTS

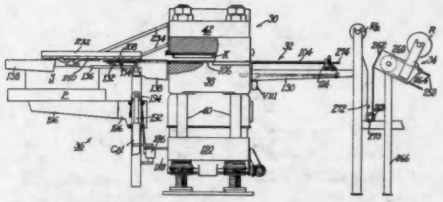
David F. Creffield, Bristol, England, assignor to USM Corporation, Boston, Mass.

Original application Nov. 14, 1967, Ser. No. 682,953. Divided and this application Apr. 27, 1970, Ser. No. 48,568

Claims priority, application Great Britain, Nov. 16, 1966, 51,259/66

Int. Cl. B65h *29/34*

U.S. Cl. 83—96 **7 Claims**



A cutting press having a beam and a bed arranged for relative movement of approach and separation is provided with improved means for handling the cut product. The product handling means includes an improved separator means comprising separator elements and a plurality of independently yieldable support elements disposed above a table for receiving the cut product to urge separation of the cut product along cuts made by the press to lay the cut product on the table.

3,656,381

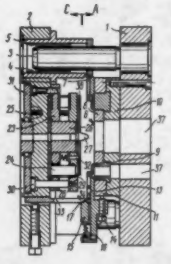
COMPOUND DIE FOR PUNCHING SHEET MEMBERS FROM CIRCULAR BLANKS IN PUNCH PRESSERS WITH VERTICAL DISPOSITION OF BLANKING PLANES

Vitaly Konstantinovich Gilev, proezd, 65, kv. 16.; Volf Nakhimovich Evzlin, ulitsa Chapaeva, 102, kv. 53.; Gennady Nikolaevich Kamalov, prospekt Kirova, 30, kv. 57.; Rafael Tevosovich Sarkisov, ulitsa dga-Nematully, 20a, blok 3, kv. 28.; Ernst Arakelovich Stephanian, ulitsa Druzhby Molodezhi, 2, kv. 36., and Rustam Makhmud Ogly Shakhmaliev, prospekt Nefti, 24, kv. 8., all of Baku, U.S.S.R.

Filed Oct. 31, 1969, Ser. No. 872,872

Int. Cl. B26d *7/02*

U.S. Cl. 83—133 **2 Claims**



Compound dies for punching sheet members from circular blanks in punch presses with a vertical disposition of the blanking planes. The compound die has a movable plate provided with punches, a lifter for removing a completed member and a means for centering the blank relative to the

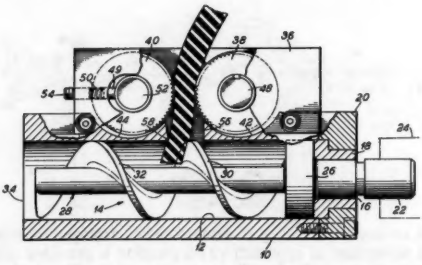
female die. The female die is arranged on a stationary plate the lower portion of which is provided with supports for holding the blank on the stationary support. The stationary plate has a device for holding the blank against the face of the female die comprising at least two movable holder. These holders are positioned in the blanking plane in opposite relationship and along an axis perpendicular to the direction of movement of the blank.

3,656,382

RUBBER OR PLASTIC FEEDER-CUTTER

Charles A. Cyphers, Mt. Gilead, Ohio, assignor to Sund-Borg Machines Corporation, Tremont, Ohio

Filed Aug. 28, 1970, Ser. No. 67,721
Int. Cl. B26d *9/00*
U.S. Cl. 83—150 **6 Claims**



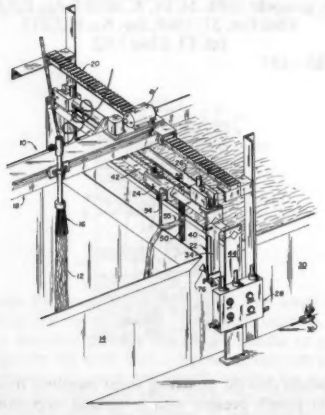
Apparatus for cutting strips or rope-like lengths of material, especially rubber, or rubber-like plastic material, or plastic having a rubber like consistency, into discrete, shorter lengths for subsequent working.

3,656,383

APPARATUS FOR AUTOMATICALLY CUTTING CONNECTING TOW OF CONTINUOUS FILAMENTARY MATERIAL BETWEEN TOTE BOXES

Merton L. Dibble, and Edward A. Morehead, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 9, 1970, Ser. No. 88,004
Int. Cl. B26d *7/10*
U.S. Cl. 83—167 **12 Claims**



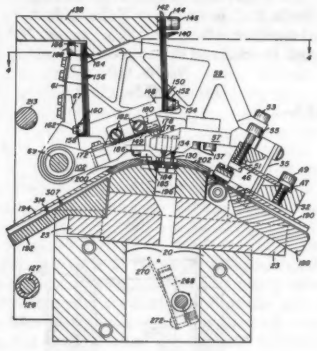
Apparatus for automatically cutting a connecting tow of continuous filamentary material that extends between tote boxes that are in loading and off-loading positions, respectively. The connecting tow is engaged and consequently is held by a member attached to a carriage that moves between the tote boxes, and is guided and moved to an electrically energized heat severing device that is located to one side of the path along which the tote boxes move, whereupon the connecting tow is cut by the heat severing device and one of the cut ends is caused to drop into the tote box that is in loading position.

3,656,384

INTERMITTENT HIGH SPEED PERFORATOR

Jasper S. Chandler, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 27, 1970, Ser. No. 40,951
Int. Cl. B26d *5/22, 7/16;* **B26f** *1/02*
U.S. Cl. 83—228 **14 Claims**



An intermittent film perforator capable of operating at a shuttling and punching rate up to 12,000 perforations per minute, having a design life of 16,000 hours, and readily adapted to perforate different film formats and film widths. The heart of the perforator is a novel film shuttling mechanism having a cam and follower design which is subject to a minimum of wear and which is resiliently mounted so that it can be tuned to reduce the load of the bearings of the drive therefor.

The perforator is provided with an automatic threading mechanism which will thread unperforated film to and through the punch mechanism and to the shuttle mechanism, thus eliminating the necessity of temporarily splicing the ends of a new film to the end of an expiring film or providing the end of a new film with perforations to insure its being handled by the perforator. This automatic threading mechanism intermittently advances the film to the punch and shuttle mechanism by intermittently frictionally engaging the same and advancing it in increments substantially equal to the perforation pitch and the advancing stroke of the shuttle mechanism.

Both the novel shuttle mechanism and the automatic threading mechanism of the perforator are not limited to use in perforators but can be used independently to intermittently feed motion picture film through a motion picture camera or a motion picture projector with little or no modification.

3,656,385

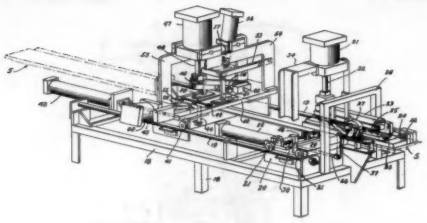
APPARATUS FOR MACHINE FORMING EXTRUDED PLASTIC SIDING

Sol B. Kimbrell, McPherson, Kans., assignor to Certain-Teed Products Corporation, Ardmore, Pa.

Filed Mar. 10, 1970, Ser. No. 18,157
Int. Cl. B26d *9/00*
U.S. Cl. 83—290 **8 Claims**

Equipment is provided for machine forming, e.g., cutting off, punching, and the like, extruded siding formed of resin

materials. A plurality of punch blades are mounted in a linear series for punching nail holes in the hanger edge of the siding, and a cut off knife and notching punches are mounted



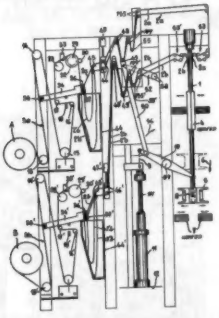
on a carriage and provide for cut off of lengths of the siding and for notching out portions of the hanger and butt edges, to facilitate overlapping of the siding upon installation.

3,656,386

DEVICE FOR DRAWING PARALLEL STRIPS WITH UNIFORM TENSION

Jean-Charles Roussel, Rhone, France, assignor to Societe Anonyme Thimonnier & Cie, Rhone, France

Filed July 17, 1970, Ser. No. 55,764
Claims priority, application France, July 18, 1969, 6923640
Int. Cl. B26d *7/00*
U.S. Cl. 83—367 **10 Claims**



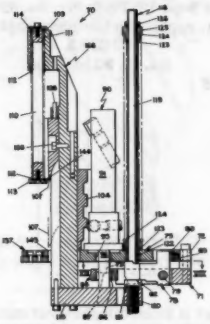
A wide web of heat-sealable plastic material, continuously unwound from a supply roll, is slitted longitudinally into a plurality of parallel strips which are entrained by a motor-driven traction roller and are allowed to hang in slack loops about one or more horizontal bars carried on the free end of a sensing lever, being then fed past an intermittently operating clamp and a drawing mechanism to an output stage where they pass through a set of friction rollers or rods and are periodically pulled forth for shaping into envelopes sealed about materials discharged from respective dispensers. With the drawing mechanism intermittently picking up the slack of the loops, the length of the shortest loop controls the position of the sensing lever which, on swinging beyond an upper or a lower limit, coacts with one of two stops to accelerate or retard the drive motor, thereby maintaining a proper average feed rate.

3,656,387

CORNER CUTTER MACHINE

Donald D. Wark, Grand Haven, Mich., assignor to The Challenge Machinery Company, Grand Haven, Mich.

Filed May 27, 1970, Ser. No. 40,893
Int. Cl. B26d *11/00*
U.S. Cl. 83—374 **13 Claims**



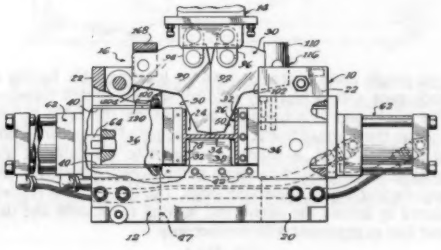
A corner cutting machine particularly adapted for rounding the corners on stacks of paper or the like employing first and second cutting tools, one such tool being slidable with respect to the other such that it slides from the non-operative position with respect to the stack to an operative position upon initiation of the cutting or shaping sequence. Means are provided for locking the movable tool in operative position with respect to the stack during the period when it is actually performing the cutting or shaping operation.

3,656,388

I-BEAM CUTTING MACHINE

Raymond L. Valente, Kankakee, Ill., assignor to Manco Manufacturing Co., Bradley, Ill.

Filed Feb. 12, 1970, Ser. No. 10,807
Int. Cl. B26d *7/02*; B23d *23/00*
U.S. Cl. 83—456 **4 Claims**



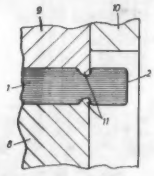
Shearing apparatus for an I-beam or other similar channel-like structures. Said apparatus is comprised of a frame which supports a fluid operated ram arrangement and various elements which define stationary die blades. Shear blade means are connected with said ram for reciprocal movement, said shear blade means being co-operable with the stationery die blades to effect severing of the I-beam. The shear blade means are defined by a pair of blade members which are in effect mirror image parts. The respective blade members are mounted for pivotal movement relative to the ram and to each other in an outward direction transverse to the axis of the said I-beam. Accordingly, during the severing operation,

said members will force the flange portions of the I-beam outwardly to prevent inward curling thereof.

3,656,389
REED CONTACT SHEAR

Walter Eckstein, Asperg, and Roland Klotz, Marbach, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 10, 1969, Ser. No. 856,768
Claims priority, application Germany, Sept. 25, 1968, P 17 89 029.8
Int. Cl. B23d *33/08*
U.S. Cl. 83—465 **2 Claims**

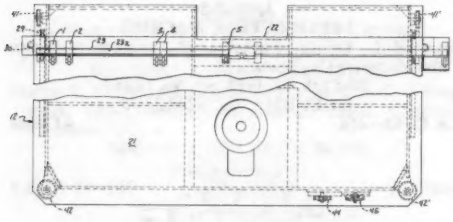


A reed contact is formed from sheet metal by means of a punching operation. The end of the contact is designed so that any burrs resulting from the punching extend away from the contact surface into a kerf-shaped recess.

3,656,390
LOCATING TABLE

Peter C. Hochstatter, Rockford, Ill., assignor to Roper Whitney, Inc., Rockford, Ill.

Filed Oct. 12, 1970, Ser. No. 79,749
Int. Cl. B26d *7/16*
U.S. Cl. 83—468 **15 Claims**



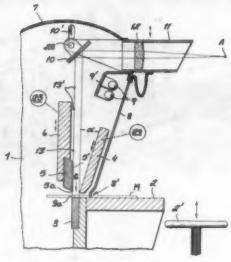
A punch press is provided with a locating table having a back gage with a plurality of drop stops mounted thereon. The back gage is adjustably mounted on the table by an endless cable arrangement which is clamped to opposite ends of the back gage. A handle is secured to the cable at the front of the table and carries a detent which selectively engages a plurality of adjustable stops. The back gage is repositioned by raising the detent and moving the handle and detent into engagement with another stop.

3,656,391
SHEARING APPARATUS WITH WORKPIECE-VIEWING MEANS

Paul Von Arx, Gelterkinderstrasse 31, ch 4450, Sissach, Switzerland

Filed Feb. 20, 1970, Ser. No. 13,081
Claims priority, application Switzerland, Jan. 19, 1970, 668/70; Feb. 26, 1969, 3119/69
Int. Cl. B26d *7/00*
U.S. Cl. 83—521 **9 Claims**

A shearing apparatus wherein a portion of a workpiece which projects over a table edge is sheared off by a generally vertically reciprocable blade while the workpiece is held firmly against the table by a clamping element. A viewer affords the operator an enlarged view of the workpiece in the gap between the clamping element and the blade. The viewer has a high-intensity light source which directs a beam of light

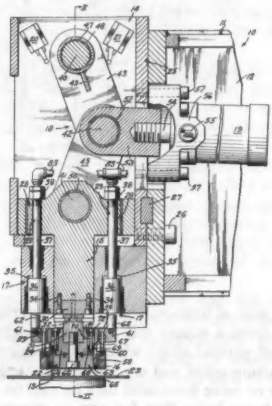


at the workpiece in the gap and a reflector and lens arranged to direct to the operator the light reflected by the workpiece. A translucent screen can be provided to afford the operator a picture-like view regardless of his position.

3,656,392
PUNCHING MACHINE

Alexander Krynytzky, West Seneca, N.Y.; Arthur K. Schott, Greensboro, N.C., and Otto Hoffmann, Tonawanda Township, Erie County, N.Y., assignors to Houdaille Industries, Inc., Buffalo, N.Y.

Original application Nov. 14, 1966, Ser. No. 596,384, now Patent No. 3,529,502. Divided and this application May 25, 1970, Ser. No. 41,142
Int. Cl. B26d *5/12, 5/18*
U.S. Cl. 83—530 **6 Claims**



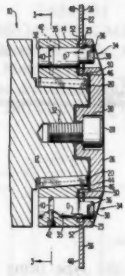
A punching machine has a C-frame, which thus has a lower die-supporting arm, and an upper arm to which is detachably secured a module, removable as a unit, which module includes a rigid head which supports a ram, a toggle linkage secured to the head and ram, and a hydraulic actuator secured to the head and toggle linkage. A key between the head and upper arm serves to locate the module and to transfer reactive thrust therebetween.

3,656,393

CARBIDE SAW BLADE LOCKING DEVICE

Willy J. Goellner, Rockford, Ill., assignor to Paramount Textile Machinery Co., Chicago, Ill.

Filed June 19, 1970, Ser. No. 47,830
Int. Cl. B26d *1/28*
U.S. Cl. 83—666 16 Claims



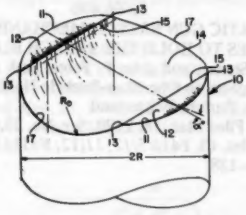
A method and apparatus for driving a saw blade and for positively locking the saw blade to the nose of a spindle which will minimize backlash between the blade and spindle. Further, a method and apparatus for locking a saw blade to a driving spindle which will permit rapid replacement of a defective or worn cutting tool. A driving spindle is provided with at least one driving and locking pin having a cam nose which is designed to engage the inner periphery of an aperture in a saw blade and positively lock the saw blade to the driving spindle.

3,656,394

PUNCH CONFIGURATION

Homer W. McCutcheon, Seattle, Wash., assignor to Tally Corporation, Seattle, Wash.

Filed Aug. 10, 1970, Ser. No. 62,333
Int. Cl. B26f *1/14*
U.S. Cl. 83—689 14 Claims



Punch configuration in which the geometry of the face involves planar surfaces which angle inwardly on opposed edges of the punch face. The angled planar surfaces terminate on a straight line and are interconnected by a grooved circular surface. As designed the punch configuration is symmetrical and the angles of the planar surfaces as well as the radius of the grooved cylindrical surface are calculated to require the least amount of punch force.

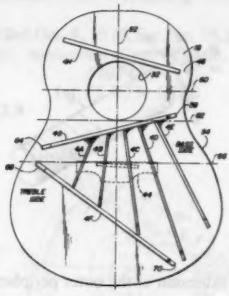
3,656,395

GUITAR CONSTRUCTION

Charles H. Kaman, Simsbury, Conn., assignor to Kaman Corporation, Bloomfield, Conn.

Filed June 8, 1970, Ser. No. 44,202
Int. Cl. G10d *1/08, 3/00*
U.S. Cl. 84—267 22 Claims

A guitar includes a body comprised of a one-piece curved bowl of fiberglass material forming the back and sides of the body and a flat wooden soundboard forming the top of the body. A unique arrangement of braces secured to the interior surface of the soundboard causes it to be tuned to a large number of different frequencies over the fully frequency and produces a full rich sound when the instrument is played.

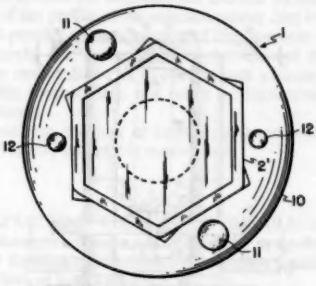


3,656,396

PROTECTIVE FASTENER HEAD

Charles E. Gutshall, Ellwood City, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 5, 1970, Ser. No. 61,058
Int. Cl. F16b *23/00, 35/00*
U.S. Cl. 85—9 4 Claims



A fastener having a head such as a hex head in which each side of the head is formed of two obtusely intersecting plane surfaces in which the line of intersection is positioned adjacent the leading edge of each corner which receives the turning torque from a driving tool. The head can terminate in a washer base having a plurality of embossments spaced there around and in line with the bottom contacting surf

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3,656,397

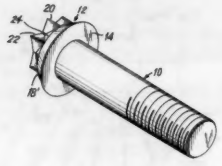
BOLT HEAD CONFIGURATION

Arthur G. Kudelko, Glenside, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Nov. 28, 1969, Ser. No. 880,612
Int. Cl. F16b *23/00, 35/00*
U.S. Cl. 85—9 11 Claims

A bolt comprising a threaded shank portion and a head member having an optimum strength to weight configuration. The head member comprises a planar base section projecting radially outwardly from the shank portion and an inclined shoulder extending upwardly from the planar base section and inwardly toward the outer periphery of an upward extension of the shank portion. A wrenching configuration is

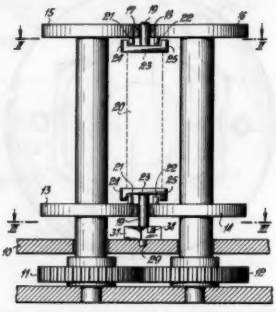
formed on the head and extends downwardly from a plane defined by the intersection of the inclined shoulder, if extended, and an extension of the outer periphery of the shank portion.



3,656,398
DEVICE FOR TRANSFERRING THE BOBBIN OF A BRAIDING MACHINE BETWEEN TWO ADJACENT FLYER WHEELS

Reiner Strangfeld, Oldenburg, Germany, assignor to August Herzog Maschinenfabrik, Oldenburg, Germany

Filed Sept. 22, 1970, Ser. No. 74,409
Claims priority, application Germany, Sept. 23, 1969, P 19 47 976.6
Int. Cl. D04c 3/20
U.S. Cl. 87—37 4 Claims

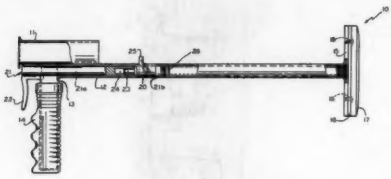


A device for transferring the bobbin of a braiding machine between two adjacent flyer wheels of the type in which a double gripper arm is provided for retaining the bobbin, which double gripper arm has retaining claws which engage behind projections arranged on each of the flyer wheels and in which the longitudinal axis of which gripper arm extends through the axis of the bobbin, in which the surfaces of the retaining claws which engage behind the projections are curved to form a radius which corresponds to the radius of turn of these surfaces about the longitudinal axis of the bobbin, the double gripper arm being rotatable relative to the flyer wheel carrying the bobbin, such that one retaining claw engages with one projection, the rotation effecting the locking or unlocking being controllable such that the transfer region extends across a specific region of the path in advance and after the point of transfer with a uniformly accelerated change in the speed of rotation from the speed of rotation of the transferring flyer wheel to the speed of rotation of the receiving flyer wheel.

3,656,399
STOCK AND TRIGGER MECHANISM FOR LINE THROWER

Orrin W. Hill, Turin, N.Y., assignor to Hall Ski-Lift Company, Inc., Watertown, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,381
Int. Cl. F41f 1/00
U.S. Cl. 89—1 G 2 Claims

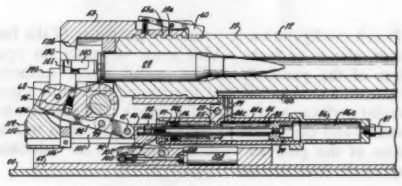


A line thrower, of the type firing a blank cartridge to propel a projectile fitting over the end of the gun barrel for carrying the end of a light line, has a rearwardly projecting pistol grip with a spring biased firing pin therethrough. A shoulder stock attachment therefor has a tubular receiver for the launcher pistol grip and a trigger mechanism therein enabling the launcher to be fired with one hand. A tube extending to a shoulder pad slideably contains a two part trigger bolt which is spring biased forward. The bolt front portion has a pendant trigger secured thereto forward of a downwardly projecting hand grip secured to the tube. The rear bolt portion is axially aligned with the front portion but is secured rotatably thereto and has a radially projecting sear pin normally projecting upward through a slot in the tube, the pin end being adapted to engage the forward surface of a nut at the end of the launcher firing pin when it is drawn back. The slot extends angularly to the tube axis so that when the trigger bolt is drawn rearwardly the rear bolt portion is rotated by the sear pin being cammed laterally to release the firing pin firing the launcher.

3,656,400
AUTOMATIC GUN BREECH MECHANISM HAVING LATCHES TO HOLD THE BREECH BLOCK OPEN

Eugene M. Stoner, and John P. Foote, both of Port Clinton, Ohio, assignors to Oberlikon-Buehrle Holding AG, Zurich-Oberlikon, Zurich, Switzerland

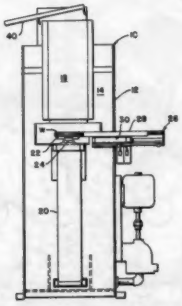
Filed Mar. 18, 1970, Ser. No. 20,615
Int. Cl. F41d 5/12, 11/12; F41f 11/00
U.S. Cl. 89—138 25 Claims



A reciprocating barrel is provided with a breech ring supporting a breech block for vertical and rotatable movement between open and closed positions of the firing chamber. The breech block is mounted on a pin having semi-circular end portions which are positioned within slots in the breech ring which control the vertical and rotational movement of the breech pin carrying the breech block. An actuator operated by explosion gases opens and closes the breech block. Breech latches hold the breech block in its open posi-

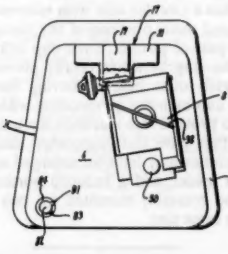
tion, and ejector slides operated by the breech block serve to lock the latches so as to hold the breech block in the open position. The ejector slides are engaged by an incoming round of ammunition to release the latches and the breech block to allow the actuator to close the breech block for the next firing cycle.

3,656,401
POT BROACHING MACHINE
Joseph A. Psenka, Bloomfield Hills, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Mar. 5, 1970, Ser. No. 16,747
Int. Cl. B23f 5/28
U.S. Cl. 90—10 4 Claims



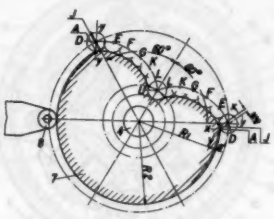
A machine for broaching external gears comprising a frame, a pot broaching tool positioned with its axis vertical at the upper portion of the frame, a piston and cylinder device with its axis vertical located directly beneath the pot broach. The gear blank is positioned directly above a work support carried by the piston and is pushed upwardly through the pot broach to a position of clearance above. The cutting teeth of the broach are of course directed downwardly and each cutting tooth has a chip receiving space directly beneath it into which chips are formed during the broaching operation and from which chips are displaced for downward discharge.

3,656,402
KEY CUTTING DEVICE
George F. French, 820 Arlington Ave., Berkeley, Calif.
Filed Mar. 23, 1970, Ser. No. 21,581
Int. Cl. B23c 1/16
U.S. Cl. 90—13.05 5 Claims



A device for duplicating a pattern key from a key blank including a cutting member, a planar surface mounted adjacent the cutting member, a guide member adapted for engagement with the pattern key, key holding means holding the pattern key in parallel face to face registration with the blank stock key and having a surface in sliding contact with the planar surface for movement of the stock key against the cutting member and the pattern key against the guide member.

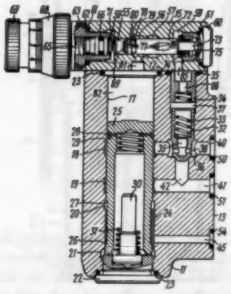
3,656,403
CONTROL ARRANGEMENTS FOR AN AUTOMATIC MACHINE TOOL
Alfred Schmermund, 5820 Gevelsberg, Postfach 144, Germany
Filed Oct. 8, 1970, Ser. No. 79,161
Claims priority, application Great Britain, Oct. 23, 1969, 52039/69
Int. Cl. B23c 1/16
U.S. Cl. 90—13.9 4 Claims



This invention relates to a control arrangement for an automatic machine tool having a pair of identically profiled parallel master plate cams which are mounted on a movable carrier with their profiles reversed with respect to each other. The profile of a selected one of the master cams is sensed by a main follower which is coupled to control means for controlling a milling tool operating on a rotating workpiece. An auxiliary cam is rotated with the workpiece and an auxiliary follower co-operating with the auxiliary cam is coupled to the carrier to control the displacement thereof. At least one end portion of the profile of the selected master cam is linear and disposed parallel to the direction of displacement of the carrier, whereby the displacement of the selected master cam when the main follower is in contact with a linear portion of the profile thereof does not result in displacement of the main follower.

Alternatively, the pair of master cams are replaced by a single reversibly mountable master cam.

3,656,404
HYDRAULIC TIME RELAY FOR HYDRAULIC SYSTEMS
Boris Yakovlevich Landenzon, Moskovsky prospekt, 238, kv. 1, and Rafail Alexandrovich Filatov, ulitsa Girshmana, 18, kv. 8, both of Kharkov, U.S.S.R.
Continuation of application Ser. No. 822,616, May 7, 1969, now abandoned. This application Mar. 9, 1971, Ser. No. 122,547
Int. Cl. F01b 29/04; F15b 21/02
U.S. Cl. 91—38 2 Claims

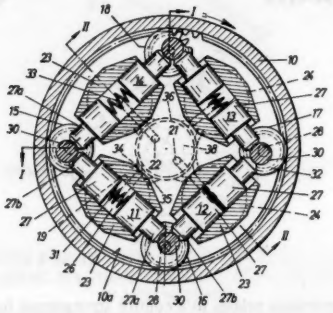


A hydraulic time relay for hydraulic systems with a throttle plug installed so that it can move to and fro along its axis.

3,656,405
PRESSURIZED MEDIUM MOTOR

Karl Klinkhammer, Bielefeld, Germany, assignor to Gebr. Dickertmann Hebezeugfabrik A.G., Bielefeld, Germany

Filed Nov. 10, 1970, Ser. No. 88,446
Claims priority, application Austria, Nov. 11, 1969, A 10578/69
Int. Cl. F01b *15/00, 7/02*
U.S. Cl. 91—176 8 Claims

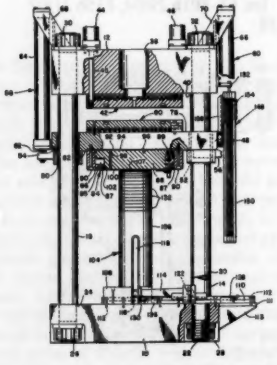


A pressurized medium motor comprising a housing, a plurality of opposed pivotally mounted piston and cylinder units in the housing and adapted to be successively supplied with pressurized medium, each unit acting on eccentric drive means geared positively or non-positively with the housing, the opposed piston and cylinder units with the eccentric drives forming a polygon having a substantially constant circumference with varying side lengths, with an adjacent pair of units each having one piston end acting on a common eccentric part of an eccentric drive, each such unit being provided with at least one passage acting as a supply or discharge means for the pressurized medium, the said passage(s) being alternately connected automatically to pressure and exhaust passage, the said pressure and exhaust passages being connected in turn to all the units.

3,656,406
CONTROL APPARATUS FOR DOUBLE-ACTING HYDRAULIC CYLINDER AND PISTON ASSEMBLY

James R. Mercer, Akron, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed Feb. 1, 1971, Ser. No. 111,328
Int. Cl. F15b *15/22*
U.S. Cl. 91—401 7 Claims

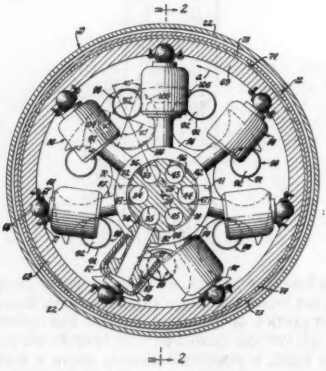


A safety vent valve or poppet valve assembly for a double-acting hydraulic cylinder, having duplex, opposed coaxial valve poppets closing a valve bore through the piston, and having a means to open the valve bore when the piston has moved beyond its working limits to provide a channel to vent fluid under predetermined excessive pressure. The venting of fluid under pressure when the piston has moved beyond its normal working stroke substantially reduces the force exerted by the piston upon the restraining machine member.

3,656,407
RADIAL PISTON PUMP

Gilbert K. Hause, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 1, 1970, Ser. No. 42,263
Int. Cl. F01b *13/06*
U.S. Cl. 91—490 26 Claims



A hydrostatic pump or motor having a fixed pintle and a spider having radial pistons fixed thereon and rotatably mounted on the fixed pintle. Each piston has a spherical head cooperating with a cup like cylinder supported in an annular bearing ring which is rotatably mounted on an axis eccentric to the spider axis. The spider and ring are driven at the same speed by a pin and cam drive. In one embodiment, the power shaft directly drives the ring which drives the spider through a pin and cam mechanism for rotation at the same speed. In another embodiment, the power shaft directly drives the spider which drives the ring through a pin and cam mechanism. The pin and cam drive mechanism has a pin with a rotary bearing thereon fixed to one of the spider or ring, and the other has a circular cam with relieved portions at the radially inner and outer portions of the circular cam located between each pair of pistons. Each cup cylinder member is mounted on the ring by a universally pivoted stud or by a cylindrical caged roller bearing having limited movement relative to the cup member cooperating with the base of the cup member to provide free sidewalls for uniform expansion. The cup members have fluid supported sleeves to limit expansion. The pintles may have an enlarged eccentric portion to support the spider and a reduced portion so the rotary housing can be rotatably mounted on two small diameter bearings of the same size.

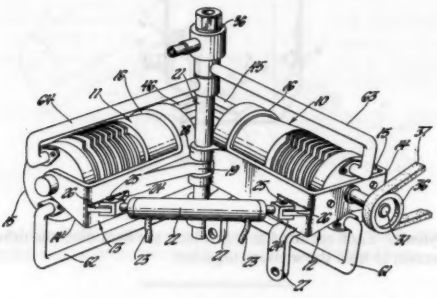
3,656,408
VARIABLE DISPLACEMENT MECHANISM

Robert M. Fox, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1970, Ser. No. 88,062
Int. Cl. F01b *13/04*
U.S. Cl. 91—500 8 Claims

A variable displacement mechanism for use as a prime mover, pump or compressor having a frame supporting a pair

of cylinder barrels for rotation about their common respective axes which can be varied from 90° to 180° with respect to each other, each cylinder barrel including a plurality of equally angularly and radially spaced cylinders having pistons therein which are interconnected through pivotal connectors



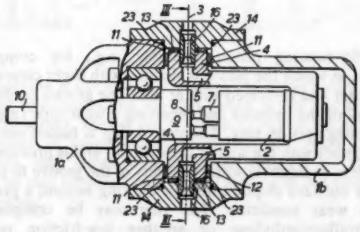
with corresponding pistons of the other cylinder barrel to permit reciprocating motion of the pistons and transfer or torque between these pistons and the rotatable cylinder barrels during rotation and between the rotating cylinder barrels and a shaft fixed to one of the cylinder barrels.

3,656,409

TILTING HEAD AXIAL PISTON HYDRAULIC MACHINES

Jean Ulrich Thoma, Bellevulivez 23, Zug, Switzerland, and Renzo Galdabini, Via Ivrea 1, Gallarate, Italy

Filed Mar. 5, 1970, Ser. No. 16,860
Claims priority, application Switzerland, Mar. 5, 1969, 3760/69
Int. Cl. F01b *13/04*
U.S. Cl. 91—504 **4 Claims**



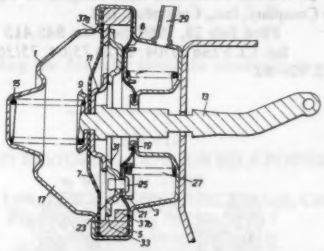
An axial piston hydraulic pump or motor of the tilting head type, including a tilting body supporting a rotary cylinder block containing the individual pistons, and mounted for tilting movements about a transverse tilting axis in order to vary the capacity of the machine. The tilting head is provided with hollow trunnions mounted in bearings in a split casing, each bearing being located partly in one casing section and partly in the other.

3,656,410

SPARK ADVANCE/RETARD CONTROL SERVO FOR AN INTERNAL COMBUSTION ENGINE

William E. Trower, Hullbridge, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed July 17, 1970, Ser. No. 56,988
Claims priority, application Great Britain, Jan. 6, 1970, 551/70
Int. Cl. F01b *19/00*
U.S. Cl. 92—49 **4 Claims**



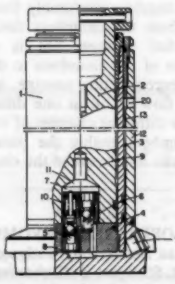
A dual diaphragm distributor actuator has a one piece ring member that separates the diaphragms and constitutes a stop to limit movement of one of the diaphragms in both spark advance and retard directions, and the other diaphragm in a spark retard direction, the stop having axially separate sets of radially depending abutments engaged alternately by a control part extending radially from the one diaphragm so as to be straddled by the abutments, the sets having circumferentially spaced arcuate parts alternating circumferentially with the parts of the other set to form a bayonet type assembly of the abutments and control part.

3,656,411

TELESCOPIC PROPS

Karl Heinz Piester, Altlunen, and Heinz Hessel, Flaesheim, U Haltern, both of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany

Filed Oct. 10, 1969, Ser. No. 865,355
Claims priority, application Germany, June 21, 1969, P 19 31 627.9
Int. Cl. F01b *7/20;* **F15b** *13/02*
U.S. Cl. 92—51 **1 Claim**



A telescopic prop with an outer member and first and second concentric inner members which inner members are disposed within said outer member and are longitudinally displaceable. The first inner member is extendable and retractable hydraulically whereas the second inner member is extendable hydraulically but retractable non-hydraulically. Each inner member has a piston facing a chamber chargeable

with hydraulic pressure fluid and two spring-biased non-return valves are operably disposed between the chambers, one valve opening in a direction between the chamber associated with the piston of the first inner member and the chamber associated with the piston of the second inner member and the other valve opening in the opposite direction.

3,656,412

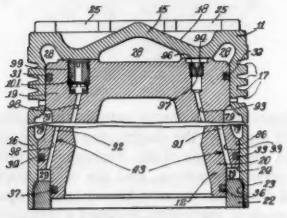
VARIABLE COMPRESSION RATIO PISTON

Harry L. Wilson, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed July 28, 1969, Ser. No. 845,413

Int. Cl. F15b *21/04;* **F02b** *75/04, 75/36*

U.S. Cl. 92—82 **15 Claims**



A variable compression ratio piston for an internal combustion engine comprising a body member connected to an engine crankshaft by a connecting rod, and a crown member relatively movable with respect to the body member so as to vary the compression ratio and clearance volume of a cylinder of the engine in which the piston operates. Movement of the crown member is caused by inertia forces and is controlled by admission and exit of oil through passages contained in the member to and from two chambers formed between the members. On relative movement of the members the volumes of the two chambers change, one volume increasing and the other volume decreasing for the same movement. For the same relative movement of the members, the change in volume for the respective chambers differs. Oil is supplied to the chambers preferably from a single supply passage and exits from the chambers through preferably a single pressure relief passage. Oil is supplied to and discharged from one of the chambers to the other chamber by means of an interconnecting passage, and this passage is capable of greater flow of oil in one direction than in the other direction. The different changes of volume for the two interconnected chambers enable the piston to be held in position by a hydraulic link between the chambers.

3,656,413

FLUID-OPERATED SERVOMOTOR

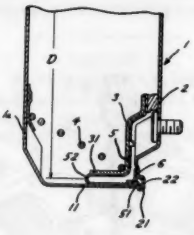
Giorgio Eggstein, San Remo, Italy, assignor to Ernst Heinkel Aktiengesellschaft, Stuttgart-Zuffenhausen, Germany

Continuation-in-part of application Ser. No. 707,734, Feb. 23, 1968, now abandoned. This application Dec. 24, 1969, Ser. No. 888,090

Int. Cl. F01b *19/00;* **F16j** *3/00*

U.S. Cl. 92—98 D **8 Claims**

Pneumatic servomotor which operates the master cylinder in a vehicle brake applying apparatus comprises a two-piece cylinder for a piston and a diaphragm. The beaded marginal portion of the diaphragm has a maximum diameter which equals the internal diameter of the cylindricsl wall of the cylinder and is sealingly clamped between the sections of the



cylinder. Each section has lugs which are bent over the other section to hold the sections together.

3,656,414

PISTON ASSEMBLY FOR PUMPS, MOTORS AND THE LIKE

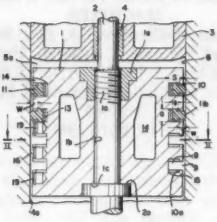
Hans-Jorg Muller, Surth, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed June 9, 1970, Ser. No. 45,091

Claims priority, application Germany, June 11, 1969, P 19 29 630.1

Int. Cl. F16j *9/06, 9/08, 9/20*

U.S. Cl. 92—249 **4 Claims**



A dry-running piston assembly, e.g., for compressor pistons, in which the piston is slidable with slight clearance in a cylinder and is formed with at least one groove confronting the wall of the cylinder and receiving a wear-type (e.g., self-lubricating) piston ring. The piston ring is biased outwardly into contact with the wall of the cylinder and is provided with shoulders engageable with shoulders of the groove to prevent further outward displacement of the ring beyond a predetermined wear condition. The ring may be composed of polytetrafluoroethylene or another low-friction or self-lubricating material.

3,656,415

METHOD AND APPARATUS FOR FORMING BAGS

Corey T. Hook, Jr., Green Bay, Wis., assignor to FMC Corporation, San Jose, Calif.

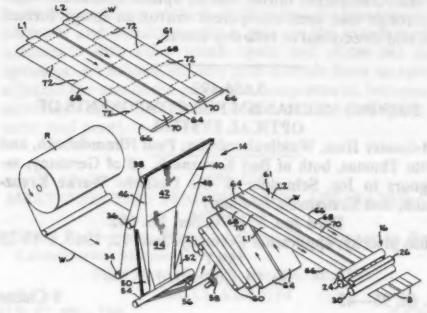
Filed Aug. 5, 1969, Ser. No. 847,587

Int. Cl. B31b *1/18, 1/42, 49/04*

U.S. Cl. 93—13 **10 Claims**

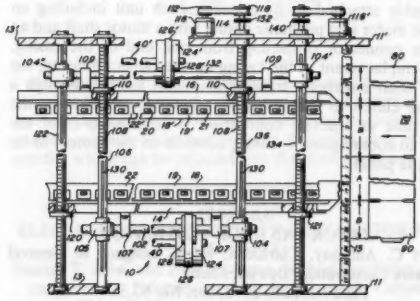
A bag forming method, and a bag forming machine including a fixed plow having guide and folding surfaces for a mov-

ing web to symmetrically fold the sides of the web and



product all the folds necessary to form, when the web is later sealed and severed, two side by side lanes of finished bags.

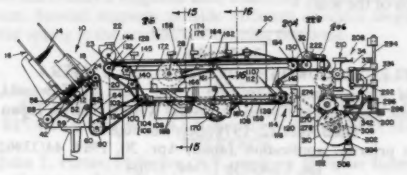
3,656,416
BOX BLANK FOLDER
Theodore Baum, Mount Laurel, N.J., assignor to Harris-Intertype Corporation, Cleveland, Ohio
Continuation-in-part of application Ser. No. 745,889, July 18, 1968, now Patent No. 3,572,221. This application Oct. 5, 1970, Ser. No. 77,788
Int. Cl. B31b *1/36*
U.S. Cl. 93—52 **9 Claims**



A machine is disclosed for folding box blanks along a fold line and interconnecting the end panels of the box blank by gluing or taping. Means are provided to permit simultaneous adjustment of longitudinally extending box blank contact members, said plates, and conveyor supports for the box blanks so that optimum position for folding of the blank may be achieved.

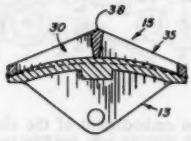
3,656,417
APPARATUS FOR PRODUCING CARTONS
John W. Scully, Raynham, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.
Filed Apr. 3, 1969, Ser. No. 813,172
Int. Cl. B31b *1/36, 1/62, 1/78*
U.S. Cl. 93—52 **1 Claim**

Apparatus comprising a side seaming device adapted to fold a prescored carton blank along two score lines and to provide an adhesively secured side seam to form a flat tube. The apparatus also includes a carton blank feeding device preceding the side seaming device for feeding blanks to the latter and a device following the side seaming device for



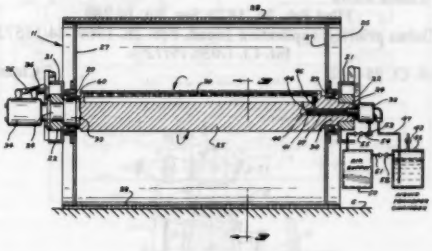
reverse folding the flat tube along the remaining two score lines.

3,656,418
WELD-ON RESTORING CAPS FOR SELF-POWERED COMPACTORS
Kenneth V. Lutz, 19782 Glen Brae Drive, Saratoga, Calif.
Filed Nov. 23, 1970, Ser. No. 91,817
Int. Cl. F01c *19/26*
U.S. Cl. 94—50 PR **4 Claims**



A restoring cap for attachment to a worn tamper cap of a compaction roller which restores the worn tamper cap to its original shape and dimension comprising a casting with a tamping surface having end portions and a ridge portion intermediate of and parallel with the end portions; side walls extending from the ridge portion toward the end portions angularly with decreasing depth; and a lower wall contoured to conform to the shape of a worn tamper cap.

3,656,419
VIBRATORY ROLLER
Melvin H. Boone, Fridley, Minn., assignor to American Hoist & Derrick Company, Minneapolis, Minn.
Filed Apr. 1, 1969, Ser. No. 811,811
Int. Cl. E01c *19/28*
U.S. Cl. 94—50 **2 Claims**



A vibratory roller with an earth compacting drum having an axially balanced shaft which is journaled in the drum and power driven for rotation relative to the drum. The shaft carries a hollow chamber which is offset eccentrically from the axis thereof and which extends substantially the entire length

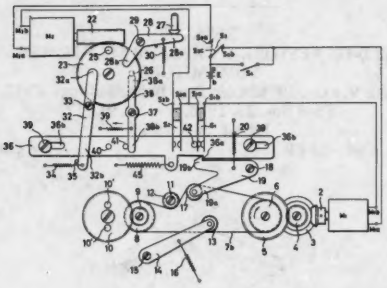
of the shaft. Means are provided for admitting liquid to and discharging it from the chamber so that the amplitude of vibration of the shaft might be varied at any selected speed of rotation of the shaft.

3,656,420

ELECTRIC DRIVING DEVICE FOR A CAMERA

Hiroshi Aizawa, and Mitsutoshi Ogiso, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1970, Ser. No. 30,880
Claims priority, application Japan, Apr. 30, 1969, 44/33962
Int. Cl. G03b *17/44, 19/04*
U.S. Cl. 95—31 EL **14 Claims**



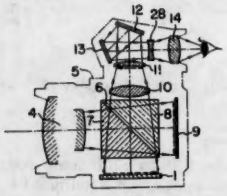
According to an embodiment of the electrical drive disclosed, a first drive motor winds the film in the camera and a second drive motor operates the shutter. A control mechanism includes member movable between one position in which the mechanism actuates the first drive motor and a second position in which the mechanism actuates the second drive motor. A manually operable switch in the mechanism starts the second motor and enables it for actuation. The control mechanism responds to the completion of operation of the second motor for moving the member to the first position. A resilient detector detects increases in exertion of the first motor beyond a given value and causes the mechanism to move the control member from the first position to the second position. The mechanism disables the switch from starting the second motor when the member is in the first position.

3,656,421

VIEWFINDER OPTICAL SYSTEM

Hisanori Ataka, Kawasaki, Japan, assignor to Kabushiki Kaisha Ricoh

Filed Feb. 26, 1970, Ser. No. 14,289
Claims priority, application Japan, Feb. 28, 1969, 44/15572
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **5 Claims**



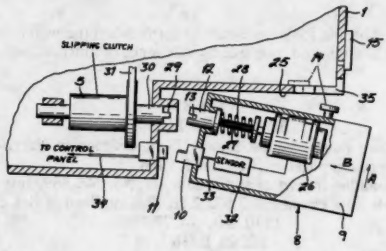
A viewfinder optical system comprising a semi-transparent mirror disposed backwardly and obliquely of an image forming lens, an image forming plane and a directional or reflextive screen disposed at conjugated positions with respect to said semi-transparent mirror and an optical system for viewing through said semi-transparent mirror an image formed upon said directional or reflexive screen.

3,656,422

DRIVING MECHANISM FOR COMPONENTS OF OPTICAL SYSTEM

Karl-Gunter Hess, Waldlaubersheim; Paul Himmelsbach, and Otto Thomas, both of Bad Kreuznach, all of Germany, assignors to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

Filed Jan. 5, 1970, Ser. No. 602
Claims priority, application Germany, June 12, 1969, P 19 29 759.7
Int. Cl. G03b *3/10*
U.S. Cl. 95—45 **9 Claims**



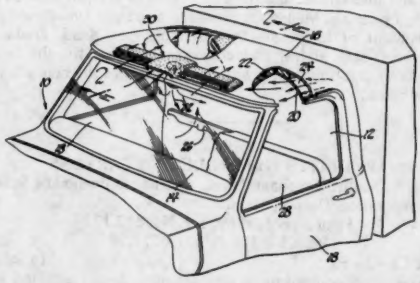
A television camera with two camming cylinders for the focusing of its objective and for the variation of its focal length (zoom effect) has two identical driving units removably attached to its housing, each unit including an electric motor in a prismatic casing with a motor shaft and an electric connector projecting from one end of the casing. Upon emplacement of the casing on the camera housing, the motor shaft engages a transmission shaft leading through a slipping clutch to the respective camming cylinder; at the same time an electric connection is established from the motor to zooming and focusing controls on the camera or on a remote panel.

3,656,423

TRUCK CAB ROOF VENTILATOR

Robert C. Anthony, Clarkston, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1970, Ser. No. 93,584
Int. Cl. B60h *1/24*
U.S. Cl. 98—2.15 **3 Claims**



In preferred form a ventilator for a vehicle passenger compartment having spaced outer and inner roof panels defining an exhaust flow path therebetween. Inlet and outlet openings

through the outer roof panel are enclosed by a housing which includes an air scoop for directing air through the inlet opening into the passenger compartment. A rotary valve member in the inlet opening controls air flow into the passenger compartment and simultaneously a gear on the rotary member actuates a slide valve which opens and closes the outlet openings. An exhaust air flow path extends from an opening adjacent the rear of the passenger compartment, between the inner and outer roof panels to the outlet openings in the outer roof panel.

3,656,424

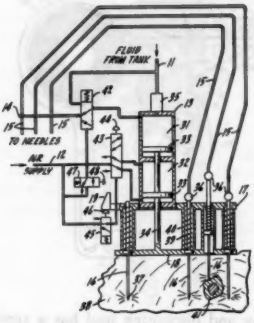
MEAT INJECTION TENDERIZATION APPARATUS AND METHOD

Clifford E. Evanson, Highland Park, Ill., assignor to Baxter Laboratories, Morton Grove, Ill.

Filed Nov. 10, 1970, Ser. No. 88,439

Int. Cl. A23l *3/34*

U.S. Cl. 99—256 **5 Claims**



An air-powered, hand-operated meat injection tenderization unit having means for receiving enzyme solution from a storage supply and for delivering measured quantities of the enzyme solution under low pressure through a gang of hollow needles which can be injected into the meat carcass.

3,656,425

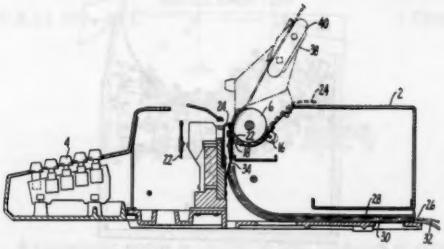
ELECTROMAGNETIC ACTUATING MEANS FOR PRINT HAMMER

Ronald T. Albo, and John Pastrone, both of Los Gatos, Calif., assignors to Information Printing Systems Corporation, Santa Clara, Calif.

Filed Mar. 20, 1970, Ser. No. 21,436

Int. Cl. B41j *9/38*; H01f *7/04*

U.S. Cl. 101—93 C **4 Claims**



An impact printer in which characters moving on an endless chain are struck on-the-fly by print hammers to print the characters on paper. The print hammers are springs supported in flexed conditions by a permanent magnet, and the springs are released by applying an electrical signal to a coil which creates a magnetic field balancing the permanent magnet. Special supports provide different effective lengths for the spring in the cocked and printing positions.

3,656,426

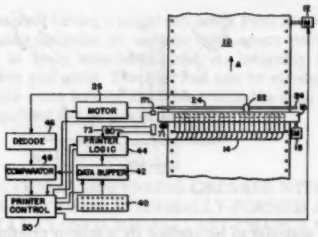
APPARATUS FOR PRINTING ALPHANUMERIC AND BINARY CODE MARKINGS AND COMPARISON MEANS THEREFOR

John T. Potter, Plainview, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Filed May 8, 1969, Ser. No. 823,054

Int. Cl. B41j *3/51*; H04l *1/00*; G06k *15/02*

U.S. Cl. 101—93 C **8 Claims**



An information printing and storage system in which a printer prints alphanumeric characters and a self-clocking code pattern on paper or card stock. A transducer scanning the printed lines senses the code pattern and provides an electrical output signal representative of the information imprinted.

3,656,427

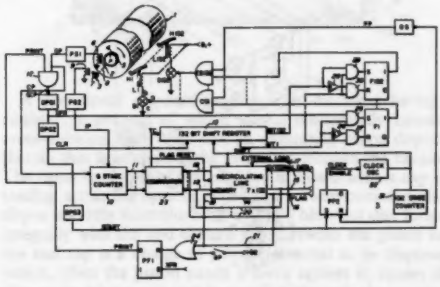
PRINT CONTROL SYSTEM FOR HIGH SPEED PRINTERS

John J. Foley, West Acton, Mass., assignor to Data Printer Corporation, Cambridge, Mass.

Filed Sept. 8, 1970, Ser. No. 70,222

Int. Cl. B41j *1/34, 9/10*; G06s *7/02*

U.S. Cl. 101—93 C **10 Claims**



A print control system for line printers of the type including a recirculating line memory adapted to be loaded with digital signals representing the characters to be printed on the line, in which the character pulses each program a search of the memory for a different associated character, and load

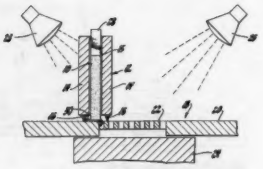
a first register with print signals for each column for which that character is to be printed. A second register is loaded with the contents of the first register representing the results of the previous search, before the scan begins. The second register controls a series of gates, one for each print hammer driver, that are enabled by a single timing pulse following and synchronized with the character pulse. The gate outputs actuate those hammers in parallel that have been selected by the contents of the second register.

3,656,428

METHOD OF SCREEN PRINTING

George A. Duncan, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 15, 1970, Ser. No. 46,115
Int. Cl. B41l *13/00*; B41m *1/12*
U.S. Cl. 101—129 **1 Claim**



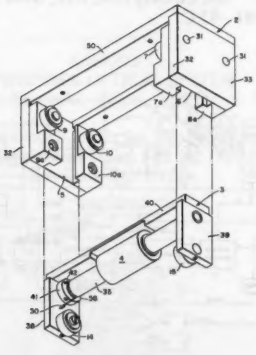
The material to be applied by a screen printing technique is mixed with a thermoplastic vehicle which is solid at room temperature and melts at a predetermined elevated temperature. The material is formed into a slab which is then pressed against a screen surface. The screen is heated enough to melt a portion of the slab and the molten material is then forced through the screen by a squeegee.

3,656,429

ROLLER IMPRINTER FOR POCKET CREDIT CARD

John Ramsey Bradford, Falmouth, Maine, and William Gerry Goodwin, West Peabody, Mass., assignors to Magnacheck Corporation, Marblehead, Mass.

Filed Nov. 2, 1970, Ser. No. 85,947
Int. Cl. B41f *3/20*
U.S. Cl. 101—269 **6 Claims**



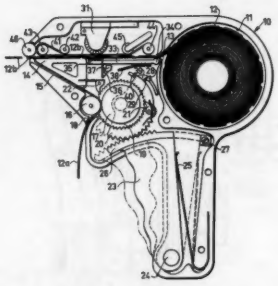
A hand-operated roller-platen type imprinting apparatus for imprinting an inserted business document form-set containing an MICR carbon sheet with machine-readable MICR code from an inserted printing plate such as a credit card containing the MICR code in relief. The roller platen is carried by a carriage over a flat printing bed and is eccentrically mounted therein to assume a printing position during the printing printing stroke and an upper nonprinting position during the return stroke. Rollers on the carriage engage the underside of the bed so that the vertical spacing of the roller platen is fixed during the printing stroke. The carriage is carried in a handle which is also independently mounted by rollers on the bed. The carriage is free to move vertically in the handle so that variations in the force applied to the handle will not affect the spacing of the roller platen.

3,656,430

LABEL PRINTING AND DISPENSING TOOL

Sture A. B. Olsson, Traneredsvagen 17 A, Vastra Frolunda, Sweden

Filed Oct. 10, 1969, Ser. No. 865,258
Int. Cl. B41j *7/70*; B32b *35/00*; B41j *1/08*
U.S. Cl. 101—288 **2 Claims**



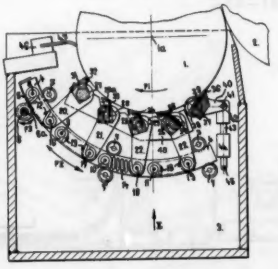
A label printing and dispensing tool has a spring biased striker which is initially set and thereafter released in response to the dispensing operation to press a label of a label tape against a printing mechanism for printing such label before dispensing it from the tool.

3,656,431

DEVICES FOR CLEANING WIPING CYLINDERS IN A PRINTING APPARATUS

Gualtiero Giori, Lausanne, Switzerland, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed May 22, 1970, Ser. No. 39,608
Claims priority, application Switzerland, May 23, 1969, 7900/69
Int. Cl. B41f *9/16*
U.S. Cl. 101—425 **8 Claims**



A device for cleaning a rotatable wiping cylinder of a printing apparatus comprises a receptacle for cleaning fluid adapted to operatively receive a portion of the periphery of

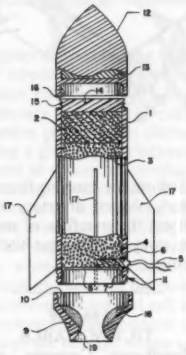
the wiping cylinder, and a scraper mounted for movement between a first position in which it engages the periphery of the wiping cylinder and a second position in which it is spaced from the periphery of the wiping cylinder. A plurality of scrapers and a brush are provided downstream of the scraper in the direction of rotation of the wiping cylinder for engaging the periphery of the wiping cylinder.

3,656,432

GRANULAR AMMONIUM PERCHLORATE PROPELLANT

Elmer Ellsworth Hackman, III, Hockessin, Del., assignor to Thiokol Chemical Corporation, Bristol, Pa.

Filed May 26, 1969, Ser. No. 827,700
Int. Cl. F42b *15/00*; **C06d** *1/04*
U.S. Cl. 102—34 **3 Claims**

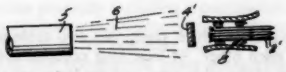


Granular ammonium perchlorate having a particle size of −40 to −50 mesh is packed to a bulk density of from about 1.0 to 1.5 g/cc in a rocket motor casing restricted to maintain a chamber pressure in the range of from about 100 to about 2,000 psia and is used as the sole source of propellant gases for propelling a rocket. A flame similarly provided may be used for other pyrotechnic applications.

3,656,433

METHOD FOR REDUCING SHOT DISPERSION

Arthur E. Thrailkill, Bel Air, and Herbert N. Lewis, Harve de Grace, both of Md., assignors to The United States of America as represented by the Secretary of the Army

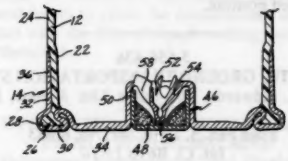
Filed Oct. 13, 1969, Ser. No. 865,838
Int. Cl. F42b *7/00*
U.S. Cl. 102—42 C **1 Claim**

A viscoelastic matrix is utilized to hold flechettes or other types of small missiles or shots in a unitary projectile form until the unit emerges from the gun barrel and until it has substantially passed through the blast region area. This reduces scattering of the missiles.

3,656,434

SHOTGUN SHELL WITH METAL CAP

Roger J. Curran, Stratford, Conn., assignor to Remington Arms Company, Inc., Bridgeport, Conn.

Filed May 26, 1969, Ser. No. 827,819
Int. Cl. F42b *5/30, 7/06*
U.S. Cl. 102—43 P **12 Claims**



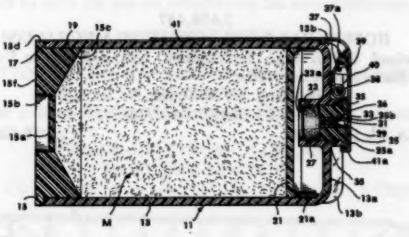
A shotgun shell having a metal cap made from sheet metal. The metal cap includes an annular fold which provides a strong cap to body attachment and an integrally formed primer pocket and anvil. The basewad can be eliminated in order to make extra volume available within the shell for additional propellant and/or projectile load.

3,656,435

DIRECTIONAL DISPENSING GRENADE WITH EXTERNALLY OPEN, INTEGRALLY-FORMED AND INTERNALLY CLOSED, PROPELLANT-CHARGE WELL AND INTERNAL FRUSTO-CONICAL MATERIAL DISCHARGE GUIDING SURFACE

Irwin R. Barr, Lutherville, and Robert W. Schnepfe, Timonium, both of Md., assignors to AAI Corporation, Cockeysville, Md.

Original application Dec. 4, 1967, Ser. No. 699,277, now Patent No. 3,512,480, which is a continuation of application Ser. No. 593,101, Mar. 31, 1966, now abandoned. Divided and this application Oct. 24, 1969, Ser. No. 868,992
Int. Cl. F42b *27/00*
U.S. Cl. 102—64 **7 Claims**



A directional dispensing grenade is disclosed having a canister, a portion of which has a substantially constant cross-sectional bore area with an obturating piston disposed therein that is adapted to be propelled through the canister. The open bore end of the canister is closed with a cap extending across the open bore end and a frusto-conical surface slopes inwardly from the bore wall to a blow-out disc formed integrally with the end closure cap. Between the piston and the end cap is a charge of powder material to be dispensed which, when the piston exerts a force against it, causes the disc to be blown out and is expelled through the resulting blowout orifice in the end cap. In the opposite end of the canister is an integrally formed, internally protruding and internally closed but externally open propellant-charge well with a rupturable bottom. The well contains an ignitable propellant-gas-generating charge which is effectively sealed therein by a cap inserted into the well which has a percussion

primer and a fuze disposed therein that are adapted to ignite the propellant-gas-generating charge to produce a propellant gas which will rupture the bottom of the well and propel the piston through the canister. The striking surface of the percussion primer is externally exposed and adapted to be struck by the firing pin of a resiliently biased hammer which is mounted between two parallel ribs and is normally prevented from striking the percussion primer by a handle and a safety pin which releasably retain the hammer in a resiliently biased, cocked position.

3,656,436

PNEUMATIC GROUND TRANSPORTATION SYSTEM

Lawrence K. Edwards, 301 Santa Lita Avenue, Palo Alto, Calif.

Filed Feb. 5, 1970, Ser. No. 8,863
Int. Cl. B61b *13/10*
U.S. Cl. 104—138 **10 Claims**

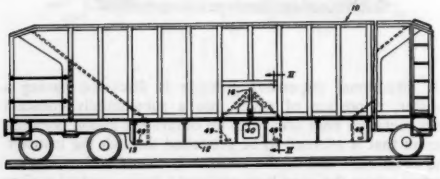
A gravity-vacuum ground transportation system in which a vehicle is propelled as a free piston through ducts from station to station along the route of the system, each duct having an entrance valve at its end at a first station, an exit valve at its end at the next station, and a pressure regulator valve in communication with a common manifold, and in which the pressure regulator valve and the opening and closing of the entrance and exit valves are controlled to control the passage of the vehicle from station to station in a manner such that the passenger carrying portion of the vehicle is immersed in atmospheric pressure air at all times.

3,656,437

HOPPER CAR DOOR ACTUATING MECHANISM

Roland T. Kuzmicki, Birmingham, Ala., assignor to United States Steel Corporation

Filed Mar. 24, 1970, Ser. No. 22,302
Int. Cl. B61d *7/08, 7/18, 7/28*
U.S. Cl. 105—240 **10 Claims**



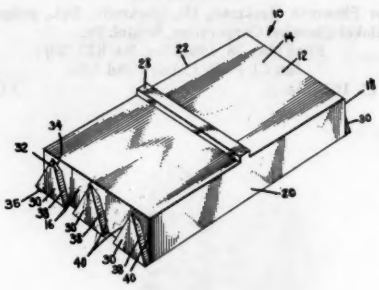
A hopper door operating and locking apparatus for bottom-opening containers, which is especially suited for use in railroad hopper cars. The locking apparatus is a vertically movable frame which, when in the raised position, allows the operating apparatus to open and close the doors, and when in the lowered position, prevents the operating apparatus from opening the doors.

3,656,438

PLATFORM FOR TRANSPORTING FOUNDRY MOLDS

Harry F. Buckner, 3665 Pondee, Dearborn, Mich.

Filed Oct. 9, 1970, Ser. No. 79,396
Int. Cl. B61d *11/02*
U.S. Cl. 105—355 **2 Claims**



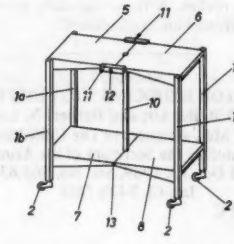
An improved platform for carrying foundry molds on a car featuring triangularly shaped diverters on the ends of the platform which direct the overflow of molten metal on the top of the platform away from the car hitch and the tracks on which the car travels.

3,656,439

TILTING TABLE

Heinz Domin, Espelkamp, Germany, assignor to Firma Bremshey & Co., Solingen-Ohligs, Germany

Filed Oct. 9, 1969, Ser. No. 865,004
Int. Cl. A47b *3/08*
U.S. Cl. 108—113 **7 Claims**

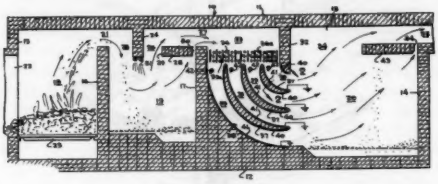


A folding table which comprises two table-tops disposed on top of each other. At least four columns are disposed at the corners of the table-tops, and the latter are pivotally connected with the columns. Each table-top comprises two table-top halves foldable towards each other, to define upper table-top halves and lower table-top halves. A folding axle of the table-top halves extends in a plane between the columns. A coupling rod connects the upper table-top halves with the lower table-top halves, and the coupling rod extends in the plane of the folding axles of the table-top halves and at a distance from the lateral edge of the table-top halves.

3,656,440
INCINERATOR HAVING MEANS FOR TREATING COMBUSTION GASES

Jerry Grey, New York, N.Y., assignor to Morse Boulger, Inc., Corona, N.Y.

Filed Oct. 26, 1970, Ser. No. 83,711
Int. Cl. F23g 5/00
U.S. Cl. 110—8 R 26 Claims

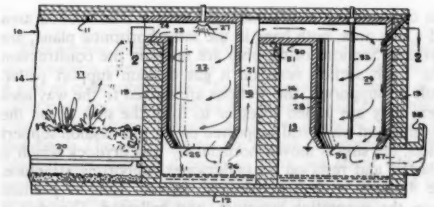


An incinerator generally including a combustion chamber, a flue, means for conducting combustion gases emanating from the combustion chamber to the flue, the conducting means including passage means for imparting a curved motion to the combustion gases, means disposed in the passage means for producing a plurality of electrostatic fields including a plurality of sets of spaced electrodes, each set of electrodes producing an electrostatic field through which a portion of the gases traverse, and means disposed either upstream relative to the means for producing a plurality of electrostatic fields, or in conjunction therewith, for ionizing the combustion gases, whereby contaminants including solids and gaseous molecules entrained in the combustion gases will be ionized by the ionizing means and subjected to cooperating centrifugal, electrostatic and gravitational forces as the gases traverse through the passage means to remove the contaminants from the combustion gases.

3,656,441
INCINERATOR

Jerry Grey, and Auram B. Zanft, both of New York, N.Y., assignors to Morse Boulger, Inc., Corona, N.Y.

Filed Oct. 26, 1970, Ser. No. 83,713
Int. Cl. F23g 5/00
U.S. Cl. 110—8 R 20 Claims

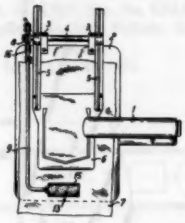


An incinerator generally including a combustion chamber, a flue and an apparatus intercommunicating the combustion chamber and the flue, for removing solid and gaseous contaminants from the combustion gases emanating from the combustion chamber and discharged through the flue into the atmosphere, the apparatus comprising a first stage separator defining at least one cylindrical chamber having a tangentially disposed inlet communicating with the combustion chamber, an outlet longitudinally spaced from the inlet and means for applying a film of liquid-washing medium on the interior wall thereof, and a second stage separator defining at least one cylindrical chamber having a tangentially disposed inlet communicating with the outlet of the first mentioned chamber, an outlet longitudinally spaced from the inlet thereof and communicating with the flue, means for applying a film of liquid-washing medium on the interior wall thereof and means for producing an electrostatic field between a locus with the chamber and the interior wall thereof, of sufficient strength to produce a corona discharge for ionizing solid and gaseous contaminants contained in the gases traversing therethrough whereby the contaminants will be subjected to combined centrifugal, electrostatic and gravitational forces to cause the contaminants to be diverted into contact with the film of liquid-washing medium and be removed therewith.

3,656,442
DEVICE FOR WITHDRAWING SEWN WORKPIECES FROM A SEWING MACHINE

Gunther Hagemeyer, Leopoldshohe, and Eberhardt Hennig, Bielefeld, both of Germany, assignors to Kochs Adlernahmaschinen Werke AG, Bielefeld, Germany

Filed Apr. 21, 1970, Ser. No. 30,511
Int. Cl. D05b 27/10
U.S. Cl. 112—214 5 Claims

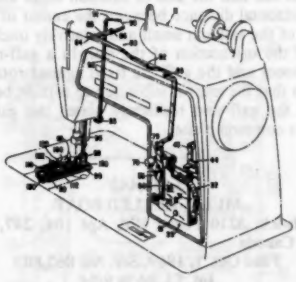


A device for withdrawing sewn workpieces from a sewing machine comprising a rotatable roll having a nonslipping coating. The device is carried by a pneumatic motor arranged within the roll and carried by a tubular rod. Control means are provided for lifting and lowering the roll, to bring it in contact with the workpiece and to admit the pneumatic motor to drive the roll for withdrawing the sewn workpiece.

3,656,443
BUTTON HOLING SYSTEM FOR HOUSEHOLD SEWING MACHINES

Roger J. Ross, Roselle, N.J., assignor to The Singer Company, New York, N.Y.

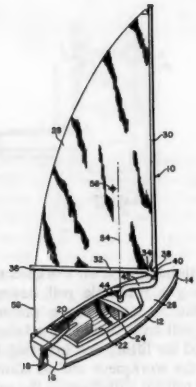
Filed Nov. 4, 1970, Ser. No. 86,926
Int. Cl. D05b 3/24, 29/12
U.S. Cl. 112—77 6 Claims



A controlling device for a buttonholing mechanism in a household sewing machine in which a member having unique construction enabling it to travel in synchronism with the work fabric is linked to a buttonholing unit in the sewing

machine to influence the length of the buttonhole. Provision is made for inserting a button in the traveling member for automatically setting the device to influence formation of a buttonhole having a length suitable to accommodate the button. A novel interrelationship between the parts is provided so that an immediate response is attained by the buttonholing unit to signals from the traveling member and as a result buttonholes of very small lengths and circular eyelets may be produced using this mechanism.

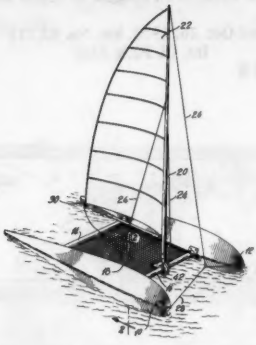
3,656,444
SAILBOAT RIGGING
Kenneth E. Kratz, P.O. Box 356, Westport, N.Y.
Filed June 3, 1970, Ser. No. 42,999
Int. Cl. B63h *9/00, 9/04*
U.S. Cl. 114—39 **15 Claims**



A sailboat in which a vertical mast is pivotally mounted upon the hull for free swinging movement about a vertical axis of rotation located aft of the mast and toward the center of the sailboat to maintain the distance between the center of effort of the sail and the axis of rotation small and to maintain the horizontal distance between the center of effort and the center of the sailboat small and relatively unchanged regardless of the orientation of the sail. In a gaff-rigged sailboat, the boom and the gaff are fixed against rotation upon the mast so that the mast is subjected to torsion between the boom and the gaff and resiliently biases the gaff and the boom into a common plane.

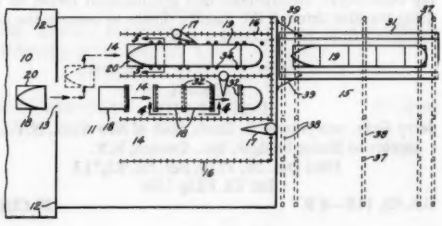
3,656,445
MULTI-HULLED BOAT
Henry Padwick, 3210 Forest Hill, Apt 104, 247, Montreal, Quebec, Canada
Filed Oct. 1, 1969, Ser. No. 862,803
Int. Cl. B63h *9/04*
U.S. Cl. 114—39 **8 Claims**

A boat comprising two or more hulls and a deck structure interconnecting said hulls at a point approximately midway between the top and the bottom of each hull so as to permit such boat to float and operate effectively when inverted and when upright. The sail for propelling the boat may be removably attached to the deck structure so that it may be



easily relocated to permit operation of the boat in the upright and in the inverted position.

3,656,446
METHOD OF CONSTRUCTING A SHIP
John J. Heffernan, Joppa, Md., assignor to Bethlehem Steel Corporation
Filed Mar. 31, 1970, Ser. No. 24,273
Int. Cl. B63b *3/02*
U.S. Cl. 114—77 R **3 Claims**

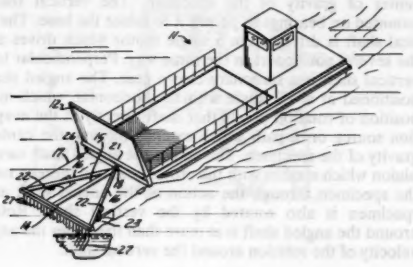


In constructing and launching a ship, a construction area and a way area, both lying in the same horizontal plane, are provided. Sections of the ship are made in the construction area. Each section rests on a gas cushion support pallet. While so supported, the sections are moved to the way area where they are joined together to form the ship. From the way area and while still supported on the gas cushion support pallets, the ship is moved horizontally to a drydock which is ballasted and rests on an underwater supporting structure. The drydock is then deballasted, moved from its position above the supporting structure, and ballasted. The ship is then floated out of the drydock.

3,656,447
DRIFTING MINE SELF PROTECTION SYSTEM
Millard T. Sniffin, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy
Filed Dec. 3, 1970, Ser. No. 94,811
Int. Cl. B63g *9/00*
U.S. Cl. 114—240 R **10 Claims**

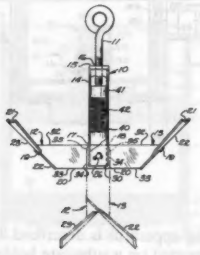
This invention discloses a system to protect bow loading small craft from floating mines. The invention is characterized by a rake like fender held in front of the craft with

vertically disposed mine engaging members depending downwardly into the water from a horizontal member. The fender is held to the front of the craft by a ball hitch and guy



wires in such a manner that the action of the bow ramp is unobstructed. Further, the unit may be quickly removed from the craft to permit normal on and off loading of cargo.

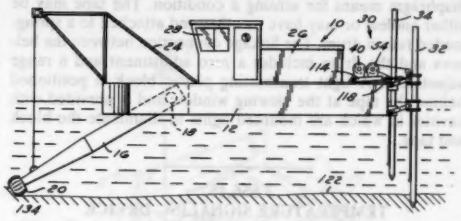
3,656,448
COLLAPSIBLE BOAT ANCHOR
Robert Lorraine Farnsley, New Albany, Ind., assignor to Aaron D. Sallee, Seymour, Ind.
Filed Sept. 9, 1969, Ser. No. 856,936
Int. Cl. B63b *21/44*
U.S. Cl. 114—208 A **2 Claims**



This anchor includes a hollow spring-loaded shank having an adjustably connected line attachment bolt at one end and a pair of collapsible anchor flukes pivotally connected at the other end. The spring-loading mechanism includes an interior compression spring engaging a plunger at the anchor end of the shank. The anchor flukes are in cam engagement with the plunger, and include a common pivot pin about which the anchor flukes are rotated from an open to a collapsed position under the application of a predetermined load.

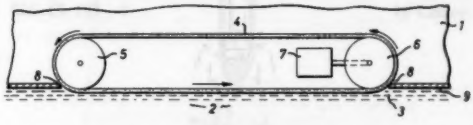
3,656,449
PROPELLING MEANS FOR A DREDGE
Herbert W. Mead, Springport, Mich.
Filed June 1, 1970, Ser. No. 42,311
Int. Cl. B63b *21/56*; B63b *15/00*
U.S. Cl. 115—9 **8 Claims**

The propelling means comprises two vertically slidable spuds mounted on the stern of a dredge. One of the spuds is a holding spud and is used to prevent drifting of the dredge when the other spud is being manipulated to propel the dredge forwardly. The other spud is a working spud and is used as an anchoring pivot point when imbedded in the bottom of a body of water to permit taking a cut. The working spud is disengaged from the bottom of a body of water after a cut has been taken and is shifted towards the stern of the dredge. It is then re-imbedded in the bottom of the body of



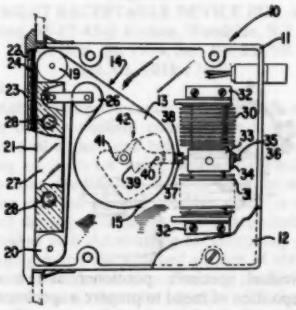
water whereupon the holding spud is removed. Power means then cause the dredge to be propelled forwardly, pushing off from the working spud.

3,656,450
FLUID PROPULSION MECHANISMS
James A. Farman, Esher, Surrey, England, assignor to Dunlop Holdings Limited, London, England
Filed Aug. 14, 1969, Ser. No. 850,003
Claims priority, application Great Britain, Aug. 20, 1968, 39,680/68
Int. Cl. B63h *1/34*
U.S. Cl. 115—63 **10 Claims**



Fluid propulsion mechanism, for example, a marine craft propulsion mechanism, a pump or turbine, comprising a drivable impeller for partial immersion in the fluid. The impeller is substantially free of transverse fluid thrust formations and utilizes the friction between the fluid and the impeller for the transference of kinetic energy therebetween. The impeller has formed in a fluid-contacting surface thereof a groove into which fluid can enter, the depth of the groove being equal to or greater than the width thereof.

3,656,451
FLAT FACE TAPE SCALE INDICATOR
Jerry L. Raznov, Philadelphia, and Donald E. Warren, Quakertown, both of Pa., assignors to Ametek, Inc., New York, N.Y.
Filed May 15, 1970, Ser. No. 37,522
Int. Cl. G01l *19/12*
U.S. Cl. 116—70 **1 Claim**



An indicator tape is supported by idler pulleys in a flat position in front of a flat viewing window and is attached to a

rotatable drum actuated by an amplifying linkage connected to a condition responsive means such as a Bourdon tube or diaphragm means for sensing a condition. The tape may be either endless or may have its other end attached to a spring-loaded return drum. The linkage connection between the bellows and the drum includes a zero adjustment and a range adjustment. A light transmitting plastic block is positioned behind the tape at the viewing window and is provided with cavities in which are mounted lights to illuminate the block and tape.

3,656,452

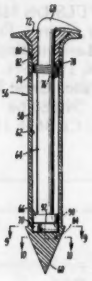
TEMPERATURE SIGNALING DEVICE

George G. Kliewer, Fresno, Calif., assignor to Dun-Rite Manufacturing Corporation

Original application Apr. 23, 1969, Ser. No. 818,540, now Patent No. 3,559,615. Divided and this application June 15, 1970, Ser. No. 46,272

Int. Cl. G01k *11/06*

U.S. Cl. 116—114.5 **1 Claim**



A torsion loaded indicating member encased within a tubular housing is released from a first orientation for rotational movement to a second orientation upon the attainment of a predetermined temperature. A fusible element is confined between the indicating member and the housing to restrain the number for movement until the element fuses at the predetermined temperature.

3,656,453

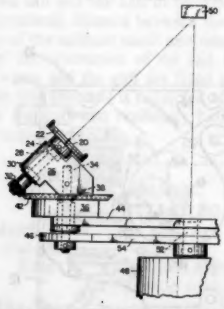
SPECIMEN POSITIONING

Anastasios J. Tousimis, Rockville, Md., assignor to Brodynamics Research Corporation, Rockville, Md.

Filed Aug. 7, 1969, Ser. No. 848,299

Int. Cl. C23c *13/08*

U.S. Cl. 118—48 **21 Claims**



An individual specimen positioner and a system for vacuum deposition of metal to prepare a specimen for observation by a scanning electron microscope. A number of specimens are held and positioned simultaneously, each positioned by an identical specimen positioner. Each specimen positioner has a grip for the specimen. The grip is mounted to a base through an angled shaft which is mounted on bearings to rotate the grip. The base is integrally connected to a vertical shaft, the axis of which extends through the center of gravity of the specimen. The vertical shaft is mounted on bearings to permit it to rotate the base. The vertical shaft is driven from a single motor which drives all of the several positioners in the same way. Perpendicular to the vertical shaft is a stationary crown gear. The angled shaft is positioned at a 45° angle with the horizontal, which in one position of rotation points that shaft directly at the evaporation source on a path which extends through the center of gravity of the specimen. The end of the angled shaft carries a pinion which meshes with the crown gear and thereby rotates the specimen through the action of the angled shaft as the specimen is also rotated by the vertical shaft. Rotation around the angled shaft is at more than five times the angular velocity of the rotation around the vertical shaft.

3,656,454

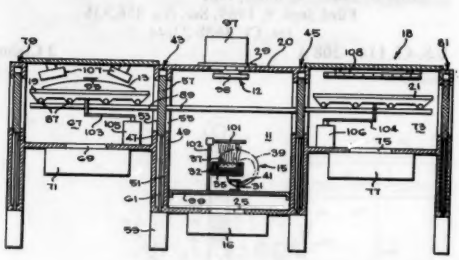
VACUUM COATING APPARATUS

Robert L. Schrader, Castro Valley, Calif., assignor to Air Reduction Company, Incorporated, New York, N.Y.

Filed Nov. 23, 1970, Ser. No. 92,359

Int. Cl. C23c *13/08*

U.S. Cl. 118—49 **7 Claims**



Vacuum coating apparatus is described wherein substrates to be coated supported on a substrate holder are moved into and from a coating chamber through ingress and egress vacuum locks, and wherein the coating chamber is maintained under continuous vacuum. A substrate holder support carriage is disposed in each of the respective vacuum locks, means reciprocate each carriage between its associated vacuum lock and the coating chamber and further means is operable to remove or deliver a substrate holder with respect to said carriages.

3,656,455

METHOD AND APPARATUS FOR IMPREGNATING MOVING PAPER WITH MOISTURE

Tamotsu Watanabe, Room 606 Marunouchi Building, Marunouchi, Chiyada-ku, Tokyo, Japan

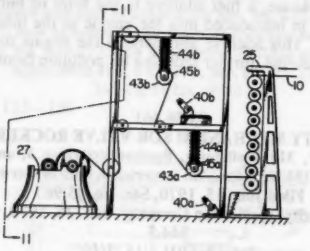
Original application Sept. 19, 1968, Ser. No. 760,815. Divided and this application Aug. 26, 1970, Ser. No. 66,972

Int. Cl. B05b *5/02*

U.S. Cl. 118—630 **9 Claims**

Electrostatically impregnating sprayed liquid particles onto a moving sheet of paper. An attracting electrode, electrically insulated from ground, is maintained at a high potential. A predetermined number of spray nozzles are connected to a liquid supply source maintained at ground potential, and these spray liquid onto the moving paper while the paper is

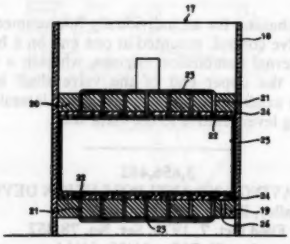
moved along the electrode, the nozzles and electrode being on opposite sides of the paper. The nozzles are spaced from the electrode, and they are arranged in parallel across the paper so as to cover the full paper width with liquid particles.



3,656,456
APPARATUS FOR INDICATING AND MEASURING ANIMAL ACTIVITY

Karl Adolf Lennart Stigmark, Bildsnidarevagen 2, 245 00, Staffanstorp; Nils Ingvar Jonsson, Silvas Grand 4, 240 20, Furulund; Jan Wilhelm Lofqvist, Winstrupsgatan 7, 222 22, and Hakan Christian Mikael Stenram, Warholms vag 8 B, VIII, 223 65, both of Lund, all of Sweden

Filed Sept. 11, 1970, Ser. No. 71,316
Int. Cl. A01k *29/00, 1/00;* **G01n** *29/00*
U.S. Cl. 119—1 **8 Claims**



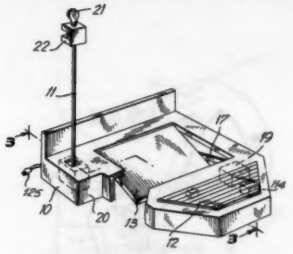
An apparatus for indication of moving activity of animals which are disposed in closed space in which at least one of the walls is provided with a number of small capacitor plates which form at least one capacitor in a balanced bridge. When the animals move the dielectric constant of this capacitor is affected and an unbalance voltage is obtained in the bridge. The variations of this voltage are indicated in an indicator connected to the bridge via a derivating network.

3,656,457
TOILET FOR HOUSEHOLD PETS

James Houston, 520 East 137th Street, Bronx, N.Y.

Filed Sept. 24, 1970, Ser. No. 75,185
Int. Cl. A01k *31/04, 29/00*
U.S. Cl. 119—1 **5 Claims**

An apparatus for detachable securement to an existing conventional toilet bowl in a bathroom consisting of a body support structure having disposed on its top surface a pressure-sensitive switch activating a first solenoid, connected to a trap door mobilized when the pet steps on the switch. Included in the apparatus is a second solenoid, responsive to the door's closing, having an extended arm for detachable coupling to the flush handle of the existing bowl. A microswitch permits delayed operation of the second solenoid, allowing automated flushing. Power may be supplied to the apparatus by either batteries or standard household current.



3,656,458
MOLLUSC CLIP

Douglas Larry Marcus, and Clifford L. Sayre, Jr., both of 1415 Ladd Street, Silver Spring, Md.

Filed June 23, 1970, Ser. No. 49,096
Int. Cl. A01k *61/00*
U.S. Cl. 119—4 **10 Claims**

A clip for securing clutch material for the intensive farming or raft culture of sessile molluscs such as the oyster. The clip provides an opening for receiving and holding the clutch material. The clip is also provided with a keyhole shaped opening for receiving a supporting line whereby the clip and clutch material is attached thereto.

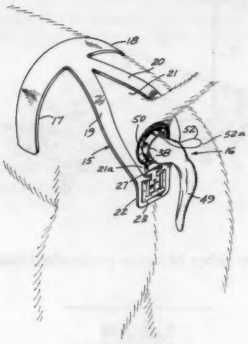
3,656,459
EXCREMENT RECEPTACLE DEVICE FOR ANIMALS

Louis Missud, 61-15 43rd Avenue, Woodside, N.Y.

Filed Mar. 30, 1970, Ser. No. 23,798
Int. Cl. A01k *23/00*
U.S. Cl. 119—95 **12 Claims**

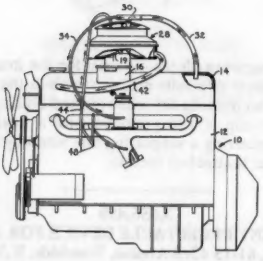
An animal excrement receptacle device with a disposable portion. A flexible resilient conduit tube is adapted to be held at the anal region, and below the tail, of an animal, a flexible bag or collector being attached to and extending rearwardly from the bag, the front of the tube supporting a combination pad and closure member which is attached to the front of the bag. The pad is of soft deformable material and is provided with a drawstring for compactly contracting it and bringing it and the attached portion of the bag into a closure position within the tube. The tube itself is detachably secured to a harness, the tube together with the bag being disposable. The upper and side portions of the conduit tube are adapted to flex with the movement of the animal's tail

and body; but when the tail is raised in the act of defecation, the resilient tube assumes its full undistorted shape, thereby



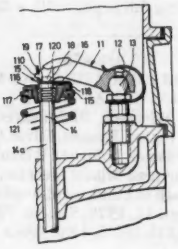
providing a passageway of maximum proportions for the feces.

3,656,460
SMOG CONTROL DEVICE FOR INTERNAL COMBUSTION ENGINE
Joe E. Rogers, Waverly, Kans.
Filed Sept. 17, 1970, Ser. No. 73,146
Int. Cl. F02f *9/02*
U.S. Cl. 123—41.86 **8 Claims**



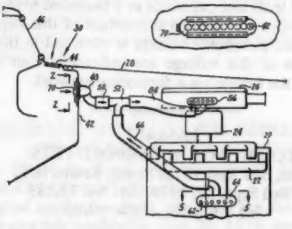
A smog control device for an internal combustion engine utilizes a first conduit which communicates the engine crankcase with the suction head of the engine to draw gases accumulating in the crankcase from the latter when the suction head is maximized. A second conduit which communicates the engine crankcase with the air passage leading into the engine draws gases accumulated in the crankcase from the latter in response to the flow of air through the air passage. A third conduit communicates the engine crankcase with the atmosphere to supply a flow of fresh air to the crankcase whenever gases are flowing through either of the first or second conduits to thereby prevent any vacuum or crankcase pressure balance in the engine. The conduits are arranged to cooperate in maintaining a perfect pressure balance in the engine at all times without the need for any valves or other moving parts. To promote the efficient combustion of fuel and thereby further reduce the accumulation of gases in the engine crankcase, a fuel additive in the form of burned exhaust gases in introduced into the engine at the inlet of the air passage. This additive also permits the engine to run on unleaded gasoline, further reducing air pollution from the engine.

3,656,461
SAFETY MECHANISM FOR VALVE ROCKERS
Udo Renger, 318 Wolfsburg, Bonhoefferstrasse 3, and Peter Thauer, 3181 Neuhaus, Am Seeterich 9, both of Germany
Filed June 15, 1970, Ser. No. 45,967
Claims priority, application Germany, Feb. 26, 1970, P 20 08 944.5
Int. Cl. F01l *1/18, 3/10*
U.S. Cl. 123—90.42 **10 Claims**



Safety mechanism for an individually fulcrummed rocking lever of a valve control, mounted at one end on a ball, especially for internal combustion engines, wherein a holder is mounted on the upper end of the valve shaft in such a manner as to axially lock and to prevent the lateral swinging of the rocking lever relative to the valve shaft.

3,656,462
GAS SAVING AND ANTI-POLLUTION DEVICE
Ferrall W. Bailey, Route 2, Kirklin, Ind.
Filed Oct. 7, 1970, Ser. No. 78,852
Int. Cl. F02m *31/08, 31/14*
U.S. Cl. 123—122 D **3 Claims**



A hot air passageway from the exhaust manifold, an adjustable cold air passageway from the vehicle interior, a T connection for mixing the cold and hot air of both passageways, and a passageway connected to the air cleaner of a carburetor bringing the air mixture thereinto.

3,656,463

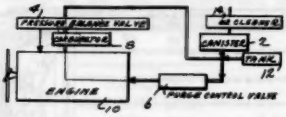
PURGING VOLATILES FROM GASOLINE STREAM

Marion F. Kranc, Bethel Park, Pa., assignor to Pittsburgh Activated Carbon Company, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 632,626, Apr. 21, 1967, now abandoned, Original application June 8, 1967, Ser. No. 655,973, now abandoned. Divided and this application Feb. 13, 1970, Ser. No. 11,276

Int. Cl. F02m *19/00*

U.S. Cl. 123—136 9 Claims



An evaporative loss control device (ELCD) for automobiles is modified to provide a variable purging air rate and thereby improve the efficiency of the ELCD.

3,656,464

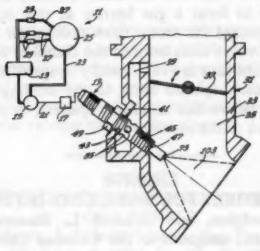
FUEL INJECTION NOZZLE AND SYSTEM

Stuart G. Hilborn, Laguna Niguel, Calif., assignor to Fuel Injection Engineering Company, South Laguna, Calif.

Filed Mar. 30, 1970, Ser. No. 23,572

Int. Cl. F02m *45/12*

U.S. Cl. 123—139 BF 19 Claims



A fuel injection nozzle having a passage extending therethrough and terminating at one end in an outlet. An atomizing device is positioned in the passage adjacent the outlet. The nozzle is preferably mounted on an intake manifold of an engine at such an angle that it directs the fuel into the manifold in the same direction as the air flowing through the manifold. The nozzle controls the shape of the spray pattern so that the cross sectional configuration of the spray pattern generally conforms to the cross sectional configuration of the manifold.

3,656,465

INTAKE AIR HEATER FOR AN AIR-COMPRESSING INJECTION INTERNAL COMBUSTION ENGINE

Gerhard Frankle, Grunbach Kreis, Waiblingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

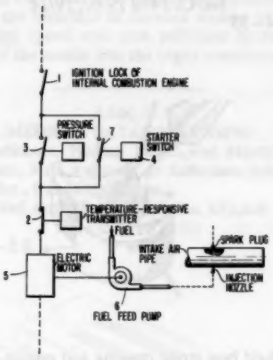
Filed Oct. 28, 1970, Ser. No. 84,633

Claims priority, application Germany, Oct. 29, 1969, P 19 54 497.9

Int. Cl. F02m *31/04*; F02n *17/00*

U.S. Cl. 123—179 H 9 Claims

A suction air heater for an air-compressing injection-type internal combustion engine which includes a spark plug and fuel injection nozzle arranged in an air suction pipe and an electric motor driving a fuel pump; an oil pressure switch controlling the operation of the heater is provided in the internal combustion engine which assures that energy is supplied to the electric motor when the engine is running; a temperature-dependent switch is series-connected with the oil pressure switch for selectively opening or closing the circuit of the electric motor while a starter switch may be connected in parallel with the oil pressure switch.



3,656,466

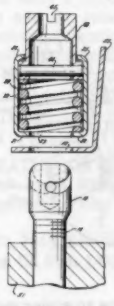
FASTENER ELEMENT AND ASSEMBLY

Theodore Dzus, Jr., West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Continuation-in-part of application Ser. No. 850,399, Aug. 15, 1969, now abandoned. This application Jan. 28, 1971, Ser. No. 110,529

Int. Cl. A44b *17/00*

U.S. Cl. 123—198 E 16 Claims

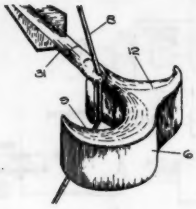


A fastener element adaptable for use with a stud shank element. One of the elements is provided with a spiral cam slot and the other of tee elements is provided with a pin mounted thereon. The fastener element includes a sleeve and a housing movably positioned in the sleeve. The pin extends diametrically across one of the elements and is supported by that element. A spring is mounted in the sleeve and abuts the housing so that when the sleeve is positioned about the stud shank and the housing compressively engages the spring while the fastener element is axially rotated, the position of the pin within the cam slot will be shifted to couple the fastener element and shank together.

3,656,467
BOW STRING DRAWING AND RELEASE DEVICE

Dale F. Halter, 2825 Bryn Maur Avenue, Hayward, Calif.

Continuation of application Ser. No. 41,495, May 28, 1970, now abandoned. This application Jan. 15, 1971, Ser. No. 106,907
Int. Cl. F41d 19/00, 19/14
U.S. Cl. 124—35 9 Claims

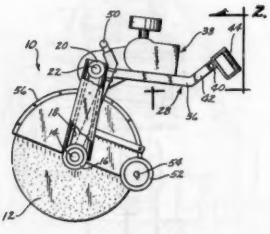


A hand held bow string drawing and release member having a notch formed for engagement with and drawing of the bow string, a finger engaging portion formed for drawing the bow string to a stable bow tensioned position with the use of a single finger, and another finger engaging portion positioned to provide a trigger release of the bow string upon squeezing down on the several finger portions. The finger engaging portion used in drawing the string is aligned with the notch in such a way that the mid-point of this portion will be directly behind the notch while the bow string is being drawn by a single finger.

3,656,468
MASONRY SAW

David P. Welden, North Indiana Avenue, Iowa Falls, Iowa

Filed May 4, 1970, Ser. No. 34,000
Int. Cl. B24b 23/00; B28d 1/04
U.S. Cl. 125—13 3 Claims

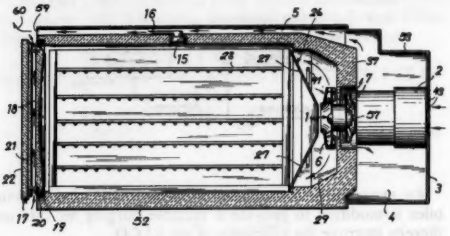


A masonry saw having an engine mounted on one leg of an L-shaped frame with the saw blade being connected to the other leg. A pair of depth wheels are mounted on a guard on the blade and provide a pivot axis for moving the saw between an at rest position and an operational position. The engine is located on the frame in such a position that it will tend to maintain the blade in cutting contact with the work piece in the operational position and in the at rest position maintain the blade out of engagement with the work piece. A modified saw includes a blade remote from the engine and on the opposite side of a frame connected to the engine such that the blade which is misaligned approximately 5° will cut flush against a work piece without interference by any of the structure of the saw equipment.

3,656,469
AIR-CIRCULATION APPARATUS FOR SELF-CLEANING OVEN AND THE LIKE

Anton Ladislaus Jung, Herborn, and Erhard Ledwon, Guntersdorf, both of Germany, assignors to Burger Eisenwerke Aktiengesellschaft, Herborn, Germany

Filed May 25, 1970, Ser. No. 40,127
Claims priority, application Germany, July 17, 1969, P 19 36 324.7
Int. Cl. A21b 1/00; F24c 15/32
U.S. Cl. 126—21 A 12 Claims

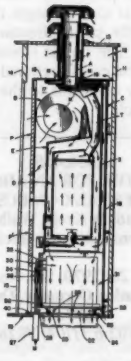


An electric motor mounted in a compartment adjacent an oven or other food-treatment chamber carries a pair of centrifugal fans, one in the chamber and one in the compartment. Each fan has on each axial face an array of radially extending vanes or blades. The two central arrays of vanes confronting each other flank the outlet of a conduit open at its inlet to the ambient atmosphere so that air is drawn in through the conduit, then drawn axially in both directions, into the chamber and into the compartment, and then expelled radially to form a gas barrier at this opening. The vanes turned toward the motor draw cooling air in over this motor and the vanes directed into the chamber circulate the gases therein. The fans are rotationally coupled together only by a few angularly spaced bolts, in the cooling-air stream, surrounded by sleeve-like insulating spacers, to prevent heat conduction back to the motor.

3,656,470
BASE ASSEMBLY FOR MOBILE HOME FURNACE

James C. Goodgion, and Armond L. Blossom, both of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.

Filed Mar. 2, 1970, Ser. No. 15,642
Int. Cl. F24h 3/00, 9/02
U.S. Cl. 126—110 AA 6 Claims



A base assembly for a downflow mobile home furnace provides an upper compartment for an air cooling coil, and a

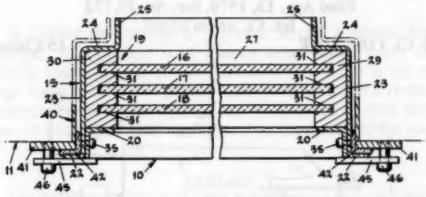
smaller base compartment, connecting duct means extending through the lower compartment and providing a perimetric space therearound. Make-up air chute means is positionable to extend downwardly from a selected side of the perimetric space, and the casing around the space provides openings for the make-up air to exit and flow upwardly around the sides of the casing as installed in an alcove or closet. Preferably, the assembly also includes a floor plate slidably receiving the casing and extending inwardly to provide the air chute mounting means on a plurality of sides thereof. The refrigerant tube means can extend through the base compartment selectively along any side thereof, the make-up air duct means terminating at the bottom of the base compartment, thereby permitting the refrigerant tubes to run over the top of the air chute if necessary.

3,656,471

GLAZING UNIT

Albert W. Olson, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Dec. 31, 1969, Ser. No. 889,519
Int. Cl. F23n 7/00
U.S. Cl. 126—200 **1 Claim**



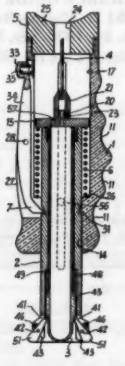
A glazing unit that provides desired transparency for viewing operations being carried out at elevated temperatures within a tunnel-like enclosure while preventing objectionable heat loss and protecting an observer of such operations. It includes a special mounting that permits ready installation and removal of the viewing surfaces for cleaning.

3,656,472

INSTRUMENT FOR THE PARENTERAL PENETRATION OF A NEEDLE

Pierre Ben Moura, 5, Cote St.-Martin, Nay, France

Filed Apr. 8, 1970, Ser. No. 26,678
Claims priority, application France, Apr. 15, 1969, 6911540
Int. Cl. G05g 17/00
U.S. Cl. 128—2 R **9 Claims**



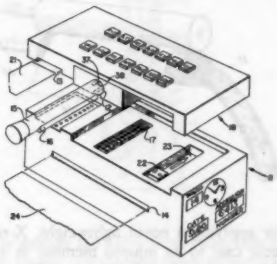
The apparatus comprises a body having a configuration such that it may readily be gripped in one hand; a support which is mounted for rectilineal sliding motion within the said body; a container which is detachably mounted within the sliding support; a hollow needle which is connected to the said container and adapted to communicate with the interior of this latter and means adapted to communicate with the interior of this latter and means adapted to cause the sliding support to carry out a movement of displacement within the body in the direction of forward motion of the hollow needle at high speed and with sufficient force to ensure penetration of the needle into the organ considered.

3,656,473

MEDICAL DATA PROCESSING

Lester A. Sodickson, Waban, Mass., and Martin J. Rubin, Chevy Chase, Md., assignors to American Science & Engineering, Inc., Cambridge, Mass.

Filed Aug. 28, 1969, Ser. No. 853,649
Int. Cl. A61b 10/00
U.S. Cl. 128—2 R **8 Claims**



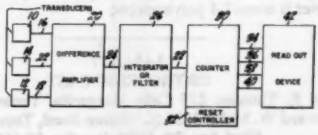
A test tube bearing a label for receiving identifying marks is keyed into a label marking unit in the presence of the patient. Unique patient identification information is transcribed from his charge plate or wrist bracelet. Specimen description information and processing directions generated by keyboard, automatic modules, or auxiliary cards are also encoded on the label. Such cards may also receive the identification information. The label is decoded in keyed reading units in the laboratory and the indicated procedures performed. The identification information is read at process junctures and transcribed automatically to additional aliquot containers as required to maintain positive identification of the specimen.

3,656,474

METHOD AND APPARATUS FOR MEDICAL DIAGNOSIS

Elwood M. Gentry, and Arnys Clifton Lilly, Jr., both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 22, 1969, Ser. No. 852,260
Int. Cl. A61l 5/00
U.S. Cl. 128—2.1 R **10 Claims**



A method for quantitative observation of body functions expressed in muscular activity is disclosed along with ap-

paratus for implementing the method in respect of both active and inactive subjects, particularly for observing coughing. The method involves the derivation and compound differencing of signals indicative of contraction of a common activated muscle, and the counting of compound difference signals. In the case of active subjects, the method provides for suppression of counting of compound difference signals where same are not indicative of the occurrence of the body function under observation.

3,656,475

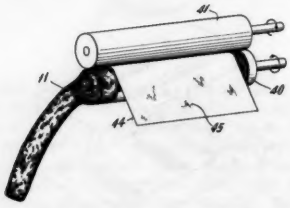
ORTHOPEDIC CAST AND PROCESS FOR APPLYING SAME

James R. Hanrahan, Jr., 45 Sturges Road, Fairfield, Conn.

Continuation-in-part of application Ser. No. 811,766, Apr. 1, 1969, now abandoned. This application Mar. 5, 1970, Ser. No. 16,907

Int. Cl. A61f *5/04*

U.S. Cl. 128—90 **16 Claims**



Process for applying a novel lightweight, X-ray transmissive orthopedic cast to an injured member in a convenient manner and in an amount of time less than conventional casts. A tubular knitted fabric base sleeve is drawn over the portion of the member being treated. An inert, impermeable barrier layer is provided thereover to space said base sleeve from an outer tubular knitted fabric sleeve which is drawn over said base sleeve. The out sleeve is impregnated, at least at its surface, with a liquid composition capable of setting in a rapid manner to form a rigid resin, e setting of said resin rendering said outer sleeve rigid.

3,656,476

POLYMERIC STRUCTURES

Frederick Bernard Swinney, Wyoming, Mich., assignor to Polymer Corporation, Sarnia, Ontario, Canada

Continuation of application Ser. No. 581,179, Sept. 22, 1966, now abandoned. This application Feb. 3, 1970, Ser. No. 12,481

Claims priority, application Canada, Feb. 16, 1966, 952364

Int. Cl. A61f *05/04*

U.S. Cl. 128—90 **8 Claims**

Orthopedic structures are prepared by forming an envelope of a defined material in a flexible form around a body member, heat-softening and uniting the adjoining portions of the envelope, and allowing the envelope to harden at reduced temperature. The defined material is a composition based on a crystalline high molecular weight polymer of a conjugated diolefinic compound; preferably the crystalline polymer is trans-1,4 polyisoprene.

3,656,477

ORTHOPEDIC CAST

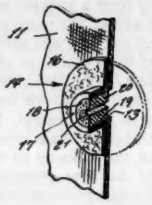
Bobby E. Thomas, 225 Calle Margarita, Tucson, Ariz., and Edward W. Maki, 3536 S. Mission Road, Tucson, Ariz.

Filed Apr. 20, 1970, Ser. No. 30,167

Int. Cl. A61f *5/04*

U.S. Cl. 128—91 R **1 Claim**

An orthopedic or medical cast, the device comprising a stockingette having a series of air vent units secured thereto, the air vent units being arranged in staggered relationship along rows, and each air vent unit being of a height



equivalent to the thickness of plaster of paris placed around the outer side of the stockingette.

3,656,478

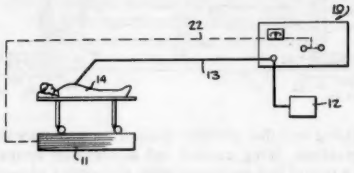
INFUSION MONITOR UTILIZING WEIGHT DETECTING MEANS

Burt L. Swersey, Hartsdale, N.Y., assignor to Brookline Instrument Company, Elmsford, N.Y.

Filed Apr. 13, 1970, Ser. No. 27,772

Int. Cl. A61m *05/00*

U.S. Cl. 128—214 E **15 Claims**



The infusion monitor is adapted to operate at a high speed or a low speed in dependence upon a variable characteristic of the patient, such as weight. If during infusion, the weight of the patient deviates from a preset value the infusion monitor speed is changed. For example, with the infusion monitor operating at the normal low speed, if the weight decreases, the infusion monitor is switched to the high speed. When the weight subsequently returns to the preset value, the infusion monitor switches back to the low speed.

3,656,479

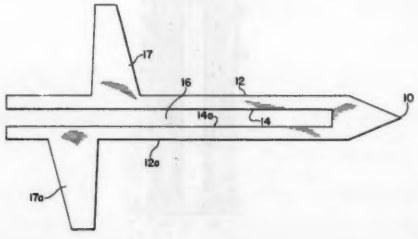
DETACHABLE GUIDE NEEDLE

James A. Huggins, 8501 W. Higgins Road, Racine, Wis.

Filed Feb. 19, 1970, Ser. No. 12,650

Int. Cl. A61m *5/00*

U.S. Cl. 128—214.4 **4 Claims**



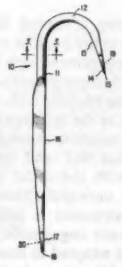
A detachable hollow guide needle assembly for piercing body portions, such as tissues, muscles, veins, to locate a

flexible catheter tube in the selected body portion for withdrawing or introducing fluids relative thereto, and which includes a metal tubular needle point at one end with portions extending rearwardly on opposite sides of a longitudinal slot having the edges thereof joined by plastic material making up the hollow assembly for receiving the catheter tube and the plastic material serving to permit complete removal of the assembly from the body inserted catheter tube.

3,656,480
SYRINGE
Jeanette Lois Rubricius, New York, N.Y., assignor to Harry H. Leveen, Brooklyn, N.Y.
Filed June 17, 1969, Ser. No. 834,020
Int. Cl. A61m *05/22*
U.S. Cl. 128—218 P **3 Claims**

A lightweight syringe is provided having a plastic foam plunger. The plunger is of unitary construction made of a plastic foam material and dimensioned so as to fit in the syringe body whereby the plastic foam material forms a resilient compression seal. The syringe can be disposed of after single use, or can be sterilized and reused, at the option of the user.

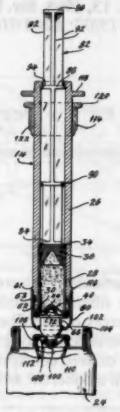
3,656,481
MAGNETIC OPHTHALMIC INSTRUMENT FOR EYE THERAPY
Richard A. Ness, 714 South Mills, Fergus Falls, Minn.
Filed Aug. 1, 1969, Ser. No. 846,709
Int. Cl. A61m *31/00*
U.S. Cl. 128—260 **26 Claims**



An ophthalmic instrument for manipulating magnetically attractable objects against the eyeball comprising a shank terminating at least at one end in a terminal portion which is flat and magnetic, said terminal portion having a blunt tip, whereby said instrument can be used to insert or remove magnetically attractable objects against the eyeball by attraction of said objects to said flat and magnetic terminal portion(s) of said instrument. One terminal portion of a preferred instrument comprises a curved arm member.

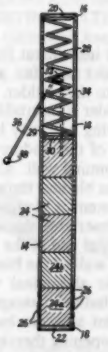
3,656,482
APPLICATOR FOR DISPENSING SUBSTANCES
Joseph Sunnen, Ladue, Mo.
Filed Jan. 19, 1970, Ser. No. 3,634
Int. Cl. A61m *31/00*
U.S. Cl. 128—261 **8 Claims**

Improvements in an applicator for dispensing substances including pressurized substances and substances in a foam or foam-like condition including an applicator for discharging such substances wherever needed including into body cavities or elsewhere including a tubular holder partially open at one end and a tubular applicator including a tubular housing adapted to be positioned in the holder, said housing having normally closed valve means at one end male operator means on the applicator constructed to cooperate with means formed on the partially closed end of the holder when pressed thereagainst to open the valve means and permit dispensing of the contents thereof, said operator means being



constructed to engage the valve means and also to cooperate with normally closed female-type valve means on an aerosol container to establish communication between the inside of the aerosol container and the inside of the applicator housing during filling and charging of the application, and a piston slidably and sealably positioned for movement in the applicator in a direction to permit material from the aerosol container to flow into the applicator during filling and charging and to be moved in the opposite direction during a dispensing operation when the applicator is positioned in the tubular holder.

3,656,483
INTRAUTERINE MEDICATOR
Harry Rudel, New York, N.Y., assignor to Biological Concepts, Inc., New York, N.Y.
Filed Jan. 15, 1970, Ser. No. 3,137
Int. Cl. A61m *31/00*
U.S. Cl. 128—264 **12 Claims**



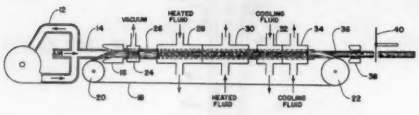
An intrauterine medicator and method for local application of medication to the uterus. The medicator includes a

perforated tube containing a supply of medication; apparatus for maintaining medication adjacent the perforations for distribution to the uterine wall, and apparatus resiliently retaining the device in the uterus.

3,656,484
FILTER

John D. Roberts; John D. Ellenberg, and Charles H. Ketih, all of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 13, 1968, Ser. No. 775,390
Int. Cl. A24b *15/02;* **A24d** *01/04;* **A24f** *07/04*
U.S. Cl. 131—267 **3 Claims**

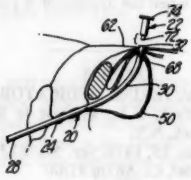


Aerosol filters, particularly cigarette filters, are formed from short synthetic fibers containing a bonding agent by confining a random array of said fibers having an orientation predominantly transverse to the longitudinal axis of said filter in an area having the desired configuration and activating the bonding agent to form a coherent article.

3,656,485
METHOD OF AND APPARATUS FOR VIEWING THE INTERIOR OF THE BLADDER THROUGH A SUPRAPUBIC INCISION

Jack R. Robertson, 1451 Refugio Road, Santa Ynez, Calif.

Filed Apr. 27, 1970, Ser. No. 32,028
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 R **6 Claims**



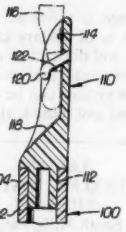
A method of and an instrument for locating a suprapubic incision into the bladder and for inserting a viewing unit through the incision into the bladder. A telescope for viewing the interior of the bladder is insertable thereinto through the viewing unit. The viewing unit may be left in place for later viewing of the interior of the bladder therethrough, and may be sutured to the abdominal wall. Also, a retention catheter may be inserted into the bladder through the viewing unit.

The insertion instrument is elongated and terminates in a curved distal portion insertable through the urethra into the bladder to bring the distal end of the instrument into engagement with the anterior wall of the bladder in register with the suprapubic area of the abdominal wall. The instrument is provided with a longitudinal passage therethrough from its proximal end to a point adjacent but spaced from its distal end, and has a lateral opening therein at the distal end of the passage. With the distal end of the instrument in engagement with the anterior wall of the bladder, the bladder is inflated with a suitable fluid through the passage and the lateral opening in the instrument. Then, the aforementioned incision is made through the abdominal wall and the anterior wall of the bladder in register with the distal end of the instrument. The distal end of the viewing unit is then connected to the distal end of the insertion instrument, and the distal ends of these devices are then inserted into the bladder through the incision. Subsequently, the distal end of the viewing unit within the bladder, and the insertion instrument is then withdrawn through the urethra, leaving the viewing unit in place for insertion of a telescope therethrough for viewing the interior of the bladder.

3,656,486
INSTRUMENT FOR INSERTING A SUPRAPUBIC CATHETER

Jack R. Robertson, 1451 Refugio Road, Santa Ynez, Calif.

Continuation-in-part of application Ser. No. 297, Jan. 2, 1970. This application Apr. 8, 1970, Ser. No. 26,727
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 R **3 Claims**



An instrument having a curved distal portion insertable through the urethra into the bladder to bring the distal end of the instrument into engagement with the anterior wall of the bladder in register with the suprapubic area of the abdominal wall. After inflating the bladder with a suitable fluid through a longitudinal passage in the instrument and a lateral opening in the curved distal portion thereof, an incision is made through the abdominal wall and the anterior wall of the bladder in register with the distal end of the instrument, which then emerges outwardly through the incision. The distal end of the instrument is provided with a recessed catheter engaging means engageable with a tip portion of a retention catheter and adapted to insert the tip portion of the catheter into the bladder through the incision. Thereafter, the instrument is disengaged from the catheter within the bladder and is then withdrawn from the bladder and the urethra, leaving a portion of the catheter within the bladder. The catheter is then inflated to retain it within the bladder.

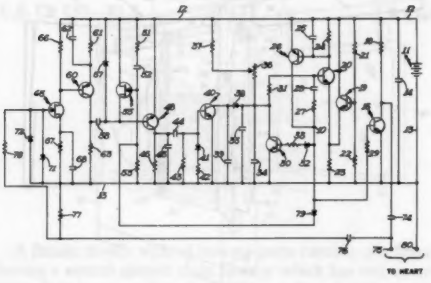
3,656,487
ELECTRONIC DEMAND HEART PACEMAKER WITH DIFFERENT PACING AND STANDBY RATES

David H. Gobeli, St. Paul, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of application Ser. No. 832,706, June 12, 1969, now abandoned. This application Jan. 7, 1970, Ser. No. 1,178
Int. Cl. A61n *1/36*
U.S. Cl. 128—419 P **20 Claims**

A demand type heart pacer which provides electronically generated stimulating pulses to the heart at a first frequency

in the continued absence of natural heartbeats, but which inhibits output pulses once the natural heart rate exceeds the first frequency, and allows the heart to beat naturally at any rate above a second, lower frequency before again providing



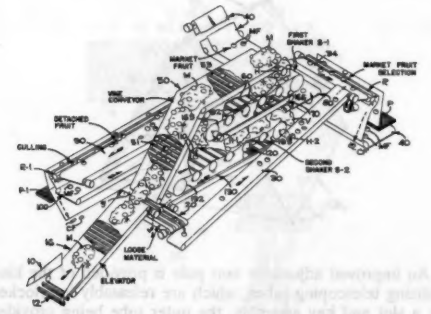
stimulating pulses, thereby creating a different standby frequency. The pacer also reverts to a third frequency in a non-demand type operation in the presence of an interfering electrical noise pattern.

3,656,488

TURNOVER SHAKER

Ferdinand J. Dumanowski, Sunnyvale; William G. Malley, San Jose, and David W. Cayton, Cupertino, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed July 29, 1970, Ser. No. 59,268
Int. Cl. A01d
U.S. Cl. 130—30 A **16 Claims**



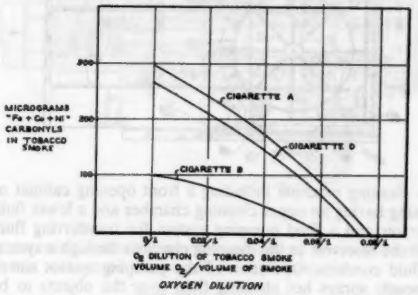
Tomatoes or the like are removed from a mass of vines and tomatoes by advancing and shaking the mass to detach some of the fruit, dropping the mass while turning it over, advancing the inverted mass along a second path in a direction opposite that of the first path while further shaking the inverted mass for detaching additional fruit. These steps are carried out on endless shaking conveyors that are oscillated by rotating kicker bar assemblies. An undershaker conveyor is disposed beneath the lower reach of each of the shaker conveyors and runs in the direction of that reach. The lower shaker conveyor extends past the delivery end of the upper shaking conveyor for facilitating the turning over action between the shakers. Sickle bars are provided at the delivery end of each shaker conveyor for cutting up vines and preventing them from being picked up by their associated undershaker conveyors.

3,656,489

METHOD OF TREATING TOBACCO SMOKE TO ELIMINATE METAL CARBONYL CONTENT THEREOF

Eldon Stahly, 2813 Deirfield Drive, Ellicott City, Md.

Continuation-in-part of application Ser. No. 765,589, Oct. 7, 1968, now Patent No. 3,473,535, which is a continuation-in-part of application Ser. No. 303,929, Aug. 22, 1963, now abandoned. This application Aug. 26, 1969, Ser. No. 853,055
Int. Cl. A24b *15/02*
U.S. Cl. 131—9 **9 Claims**


MICROGRAMS "Fe + Co + Ni" CARBONYLS IN TOBACCO SMOKE
CIGARETTE A
CIGARETTE D
CIGARETTE B
O2 DILUTION OF TOBACCO SMOKE
VOLUME O2 / VOLUME OF SMOKE
OXYGEN DILUTION

A method is disclosed for determining and introducing the amount of oxygen required to be added to tobacco smoke from conventional smoking devices to deliver a smoke free of metal carbonyls. The required increase in percent oxygen in the smoke depends in part on the content of transition metals in the unsmoked tobacco, and in part on the carbon monoxide content of the tobacco smoke, and is calculated to be equal to the product of the logarithm of the ppm of "iron + cobalt + nickel" and 4 log (percent carbon monoxide in the smoke) divided by a constant.

Specifically, the amount of oxygen added is calculated from the formula O= Log M ×4 log% CO/K. wherein O is the increase in the percent oxygen in the smoke, M is the iron, cobalt and nickel content in parts per million in the unsmoked tobacco, % CO is the per cent carbon monoxide in the smoke and K is 3.13 but not exceeding that calculated from this formula wherein K is 1.90.

ERRATUM

For Class 131—267 see:
Patent No. 3,656,484

3,656,490

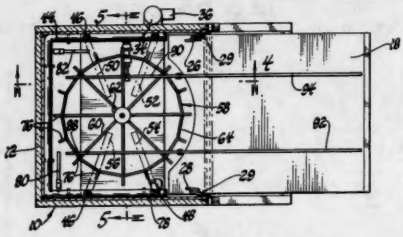
HAIR ROLLER CONTAINING HAIR DRYING EXPEDITING MATERIAL

Edward Grossman, 311 Glenwood Avenue, Leonia, N.J.

Filed Sept. 21, 1970, Ser. No. 74,064
Int. Cl. A45d *2/02*
U.S. Cl. 132—39 **21 Claims**

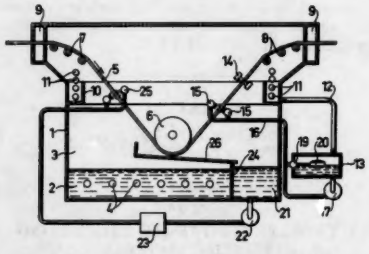
A porous hair roller containing hair drying expediting material, said material comprising a combination of a clay and a silicate.

3,656,491
CLEANING MACHINE WITH TURNTABLE TROLLEY ALIGNMENT MEANS
Thomas B. Ballard, 25550 Mulberry Drive, Southfield, Mich.
Filed Feb. 18, 1970, Ser. No. 12,350
Int. Cl. B08b *3/02*
U.S. Cl. 134—56 R **25 Claims**



A cleaning machine including a front opening cabinet or housing having an upper cleaning chamber and a lower fluid reservoir and a fluid pumping system for transferring fluid from the reservoir to the cleaning chamber through a system of fluid conduits. Operation of the pumping system simultaneously sprays hot cleaning fluid over the objects to be cleaned, rotates a turntable supporting the objects, and operates a latch mechanism to free the turntable for rotation from a predetermined working position. Sediment collection devices may be disposed in the reservoir.

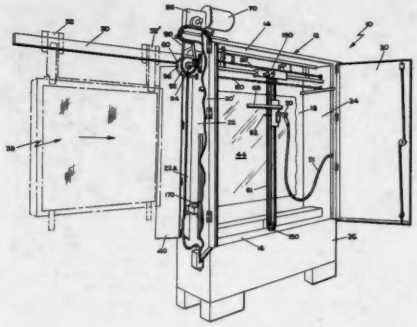
3,656,492
APPARATUS FOR STEAM DEGREASING
Kurt Anders Holm; Rune Einar Hansson, both of Skoghall, and Bengt Gunnar Berglund, Hammaro, all of Sweden, assignors to Uddeholms Aktiebolag, Uddeholms, Sweden
Filed Mar. 20, 1970, Ser. No. 21,237
Int. Cl. B08b *3/02, 15/00*
U.S. Cl. 134—64 **3 Claims**



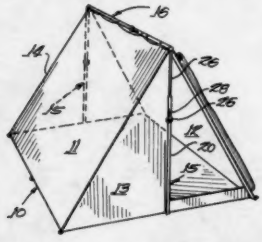
Oily articles are degreased by being immersed into the vapour of a boiling solvent, such as trichloroethylene. Immediately after the articles have entered into said vapour they are exposed to a powerful jet of oily solvent. Said oily solvent jet removes foreign particles adhering to the surface of the articles.

3,656,493
SCREEN WASHING APPARATUS
James A. Black, 13700 Sparta N.W., Kent City, Mich., and Harry Russell Farwell, 129 Ann Street, Cedar Springs, Mich., assignors to James A. Black, Kent City, Mich., by said Harry Russell Farwell
Filed Sept. 11, 1969, Ser. No. 857,163
Int. Cl. B08b *3/02, 11/02*
U.S. Cl. 134—113 **3 Claims**

Screen stencil washing apparatus with an enclosure cabinet having screen loading means extending between the exterior and the interior of the cabinet, the cabinet containing a washing gun support means advanceable across the area of the screen by controlled bidirectional movement using two inter-related conveyance means, one in one dimension and the other transversely thereto, the one having a sweeping movement and the other an incremental advancement. Lighting means is arranged to allow visual inspection upon completion of the washing cycle, through access doors. The washing gun is removable from its support means for manual washing of any local areas.

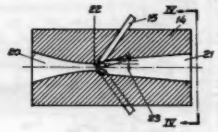


3,656,494
ADJUSTABLE TENT POLE
Cecil J. Cornett; Glen D. Dolton, and John R. Kurtyka, all of Wichita, Kans., assignors to The Coleman Company, Inc., Wichita, Kans.
Filed May 11, 1970, Ser. No. 36,300
Int. Cl. A45f *1/16;* **F16l** *27/12*
U.S. Cl. 135—15 PQ **5 Claims**



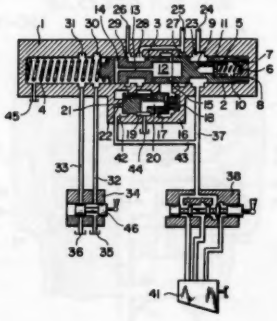
An improved adjustable tent pole is provided of the kind utilizing telescoping tubes, which are releasably interlocked by a slot and key assembly, the outer tube being provided with a single slot through which the key extends for selective engagement with a plurality of longitudinally spaced notches of the inner tube. In the improvement, the key receiving slot of the outer tube is located at a sufficient distance from the end of the outer tube so that the outer tube fully covers the notches of the inner tube whenever any of the notches are in alignment with the slot of the outer tube. The outer tube also provides an elongated sight window overlying only the central portion of the notches as the tubes are telescopically adjusted. In a preferred embodiment, the locking and key means is in the form of an integral ring member of resilient plastic material, the ring member being split on the opposite side from the key providing portion so that the ring can be temporarily expanded to a diameter where the key is withdrawn from the slot. The key member is made more readily expandible by making it thicker adjacent the key and tapering its thickness towards the split.

3,656,495
FLUIDIC DEVICES
Carl Anders Noren, Fasanvagen, Ektorp, Sweden, assignor to Atlas Copco Aktiebolag, Necka, Sweden
Filed Aug. 19, 1969, Ser. No. 851,195
Claims priority, application Sweden, Aug. 26, 1968, 11434/68
Int. Cl. F15c 1/08
U.S. Cl. 137—81.5 9 Claims



A fluidic device without moving parts consists of a housing having a verturi shaped main passage which has one or more secondary passages branched-off from the minimum section of the venturi and which form an acute angle with the outlet portion of the main passage. The cross section area of the venturi increases suddenly downstream of the branch-off point.

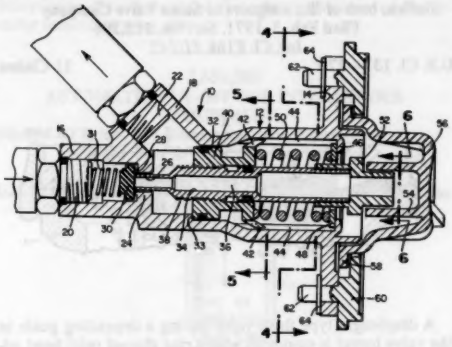
3,656,496
DEVICE FOR CONTROLLING HYDRAULIC PRESSURE
Masaru Uenoyama, and Makoto Yaoeda, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed Aug. 4, 1970, Ser. No. 60,894
Claims priority, application Japan, Aug. 6, 1969, 44/62574
Int. Cl. G05d 16/16
U.S. Cl. 137—116.3 6 Claims



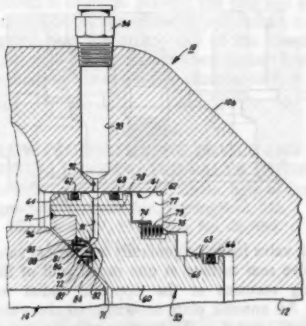
A device for controlling hydraulic pressure of a transmission having a clutch member operated by hydraulic pressure including means capable of changing the predetermined pressure of fluid within the system.

3,656,497
PRESSURE REGULATOR
Hugh Clifford Brown, Thomaston, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Oct. 9, 1970, Ser. No. 79,468
Int. Cl. F16k 31/363
U.S. Cl. 137—116.5 2 Claims

Pressure regulator has a threaded tubular control stem which when turned adjusts its position relative to spring-pressed piston or the like. Inside end of stem unseats valve from high pressure inlet to admit flow up to set pressure, and an excessive downstream pressure build-up backs stem off its seat on valve to permit pop off through stem.



3,656,498
BALL VALVE
Marvin H. Grove, and Kee W. Kim, both of Houston, Tex., assignors to M & J Valve Company, Houston, Tex.
Filed Jan. 4, 1971, Ser. No. 103,642
Int. Cl. F16k 5/22
U.S. Cl. 137—246.22 8 Claims

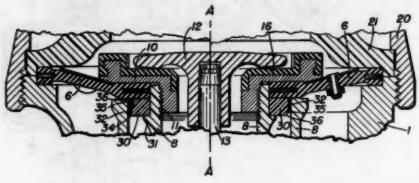


A valve of the ball type having a ported rotatable valve member (i.e., valve ball) within a valve body, and a sealing assembly which provides a seal between the body and the valve member. The sealing assembly includes a metal ring having non-metallic resilient sealing means which contacts the valve working surface of the valve ball. The fluid pressure areas of the sealing assembly are such that line pressure for flow in either direction does not cause the seal between the sealing means and the valve member to be broken. The ring is fitted and guided within the valve body in such a manner as to prevent cocking. The non-metallic resilient sealing means carried by the metal ring provides a double seal on two concentric areas, and ducts permit communication with the space between such sealing areas from the exterior of the body. Preferably only one sealing assembly is employed, and this is located in that portion of the body which is integral with the main portion of the body, whereby the remaining welded-on body part may be applied in the final phases of manufacture without disturbing the alignment of the valve member or injury to the sealing assembly.

3,656,499
ADJUSTABLE QUIET REFILL HEADS FOR FLUSH VALVES

Axel B. Nelson, Mount Prospect, and Roman F. Spacko, Darien, both of Ill., assignors to Sloan Valve Company

Filed Feb. 3, 1971, Ser. No. 112,296
Int. Cl. F16k *31/145*
U.S. Cl. 137—270 11 Claims

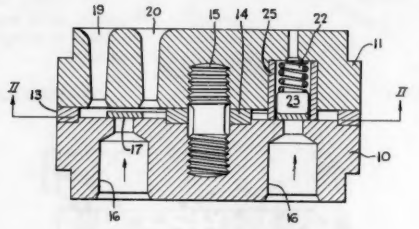


A diaphragm type flush valve having a depending guide in the valve barrel is equipped with a ring shaped refill head adjacent the valve seat to quiet the water flow and to regulate the amount of water to different plumbing fixtures.

3,656,500
CHECK VALVE

Thomas E. Mayer, Sr., Tonawanda, and George Yokota, Amherst, both of N.Y., assignors to Worthington Corporation, Harrison, N.J.

Filed May 18, 1970, Ser. No. 37,979
Int. Cl. F16k *15/08*
U.S. Cl. 137—271 9 Claims



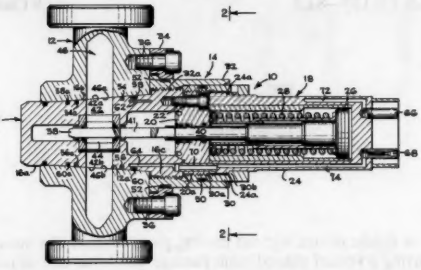
A check valve having a generally cylindrical valve chamber with a valve seat surface at one radial wall of the chamber and spring recesses at the opposite radial wall of the chamber. An annular plate seats against the valve seat surface and coil springs in the recesses bear against the annular plate valve to bias it to closed position. Teflon sleeve members in the spring recesses contain the springs and have notched ends which straddle the annular plate and thus locate it centrally of the valve structure. The notches have a depth to permit opening and closing movement of the plate and the sleeves are self-lubricating with respect to the plate edges, the springs disposed within the sleeve, and cylindrical members between the coil springs and the plate and slidable in the sleeves.

3,656,501
VALVE-OPERATOR ASSEMBLY WITH ALIGNMENT AND LOCKING MECHANISM

Ervin A. Buchta, Katy, Tex., assignor to FMC Corporation, San Jose, Calif.

Filed May 26, 1970, Ser. No. 40,657
Int. Cl. F16k *31/46*
U.S. Cl. 137—315 8 Claims

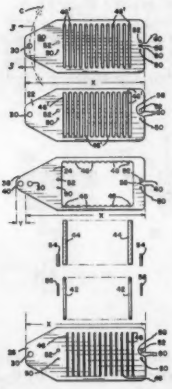
A valve and operator assembly with a mechanism for aligning the valve's flow passage coaxially with the flow passage of the housing in which the valve is positioned, and for locking the valve to the housing in the aligned position. The valve has a generally cylindrical body with a portion that is tapered to correspond to a tapered cavity in the housing, and an externally threaded portion for cooperation with an internally threaded drive nut rotatably secured to the housing to properly position and lock the valve in the cavity. The centerline of the valve's tapered portion is offset from the centerline of the threaded portion, and the centerline of the housing cavity is likewise offset from the drive nut's centerline, so that the drive nut can be threaded onto the valve body only when the valve is properly oriented in the housing.



3,656,502
FLUID CONTROL VALVE

Frank D. Howe, Painted Post, N.Y., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed July 7, 1970, Ser. No. 52,821
Int. Cl. F16k *51/00*
U.S. Cl. 137—327 5 Claims



The valve is of the flat, channel, check-type; its guide plate has an extending tab portion which can be grasped, the tab providing means by which the whole valve can be withdrawn from and inserted into the valve-using machine. This obviates any need to dismantle the machine to gain access to the valve.

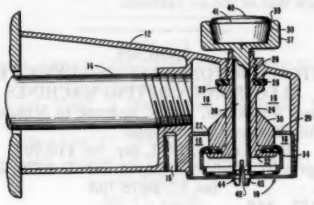
The valve includes a position orientating beveled slot in the valve seat and plates to facilitate proper installation of the valve, and teflon coating on the seat and plates, the latter providing a gasketing surfacing and to facilitate cleaning.

3,656,503

FLUID CONTROL VALVE

Irving A. Ward, 2709 La Cuesta Avenue, Hacienda Heights, Calif.

Filed May 11, 1970, Ser. No. 36,265
Int. Cl. F16k *51/00*
U.S. Cl. 137—359 8 Claims



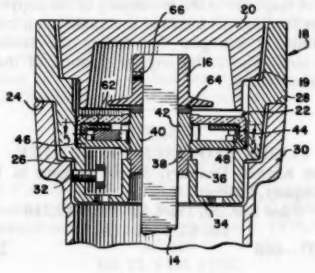
A diverter valve is provided which in a preferred embodiment has an outlet chamber which communicates with a water supply. A seat within the chamber has a central aperture through which water flows to the tub when the valve is open. The valve is closed by moving the restricted mouth of a cup against the seat where water pressure against the restricted mouth holds it in place. Standing water drains through holes in the bottom of the cup which are sealed by a flexible seal attached to a fixed post when the water pressure exceeds a selected amount. The absence of moving parts on the high pressure side of the seat and a pressure compensation feature keep the valve action smooth and uniform, regardless of water pressure.

3,656,504

BURIED VALVE POSITION INDICATOR

George F. Topinka, Oak Brook, Ill., assignor to Henry Pratt Company

Filed Feb. 27, 1970, Ser. No. 15,056
Int. Cl. F16k *1/28, 37/00*
U.S. Cl. 137—363 6 Claims



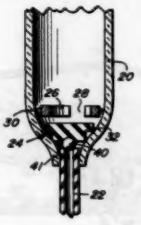
A valve position indicator for buried valves having a rotatable operator shaft extended to ground level. A pipe upright is positioned about the operator shaft and extends to ground level. An indicator housing is non-rotatably mounted in the pipe near ground level and a bearing engages the housing and the operator shaft for transferring side loads from the shaft through the housing to the pipe. A self-contained, sealed indicating gear box unit is slidably mounted over the upper end of the extended operator shaft, with a driving gear rotatably coupled with the operator shaft. The gear box has an outer portion coupled with the the housing, locking the gear box non-rotatably to the housing. The gear box unit has an interior indicia carrying gear movable circumferentially about the gear box less than 360° for multiple turns of the operator shaft, and the gear box has an outer top cover having stationary indicia positionable relative to the indicia carrying gear so as to be indicative of open and closed positions of the valve, the top cover being transparent to permit visual observation therethrough of the relative position of the interior indicia carrying gear.

3,656,505

AUTOMATIC CUT-OFF FOR INTRAVENOUS EQUIPMENT

Ellen M. O'Brian, 221 Bilmarsan Drive, Biloxi, Miss.

Filed May 6, 1970, Ser. No. 34,998
Int. Cl. F16k *31/18*
U.S. Cl. 137—399 5 Claims



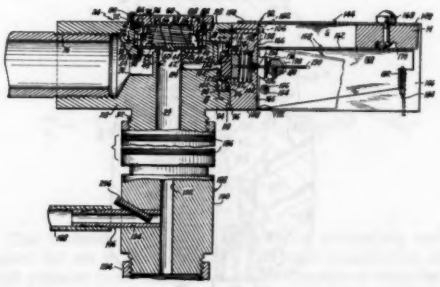
A valve assembly is positioned in the drip chamber of a conventional intravenous container and includes a steel flotation ball which seals the chamber orifice when the intravenous liquid in the container is expended. A floatation plug floats above the ball and serves as a hold-down means for clamping the ball against the orifice when the fluid is almost expended. In order to prevent the ball and plug from floating to an upper portion of the drip chamber, a retaining ring is fastened near the orifice end of the chamber. The valve assembly goes into operation when the last few drops of intravenous fluid remain at the drip chamber orifice.

3,656,506

FLOW PROPORTIONING DEVICE AND MAGNETICALLY OPERATED VALVE THEREFOR

Dennis E. Jackson, and Francis R. Rustin, both of Springfield, Mo., assignors to Naremco Inc., Springfield, Mo.

Filed June 17, 1970, Ser. No. 46,860
Int. Cl. F16k *31/34, 31/56*
U.S. Cl. 137—414 13 Claims



A device for blending measured amounts of stock solution into drinking water for fowl and livestock, including a magnetically operated, instantly responsive water supply valve. The supply valve includes flow control means and a pilot valve for controlling the same, the pilot valve being operated by a lever arm having a float suspended therefrom. A magnet

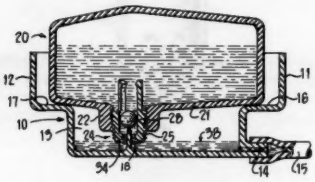
holds the lever arm in a first position until the float places sufficient pull thereon to overcome the magnetic attraction, whereupon the arm instantly changes to a second position and operates the pilot valve to open the flow control means. When the liquid level rises sufficiently to ease the pull of the float, the magnet snaps the lever arm back to its first position, thus instantly closing the supply valve.

3,656,507

LIQUID LEVEL CONTROL SYSTEM

Leonard S. Martinez, San Leandro, Calif., assignor to The Singer Company, Friden Division, New York, N.Y.

Filed Aug. 6, 1970, Ser. No. 61,552
Int. Cl. G05d *9/00*
U.S. Cl. 137—454 **3 Claims**



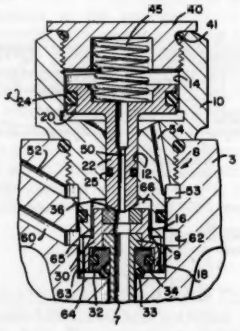
A reservoir from which liquid may flow at a metered rate with the liquid normally maintained at a predetermined level. The liquid is supplied to the reservoir by a top-mounted container having a downwardly extending internally threaded neck into which a liquid level control valve assembly is threaded. The valve assembly cooperates with an upwardly extending protrusion mounted on the reservoir bottom to allow liquid to flow from the container to the reservoir. The liquid level in the reservoir may be adjusted by varying the vertical position of the control valve assembly.

3,656,508

WATER VALVE FOR ROCK DRILLS

Ronald R. Boychuk, and Sigmund I. Slettemoen, both of Sudbury, Ontario, Canada, assignors to Canadian Ingersoll-Rand Company Limited, Montreal, Quebec, Canada

Filed June 15, 1970, Ser. No. 46,418
Int. Cl. F16k *31/14*
U.S. Cl. 137—495 **6 Claims**



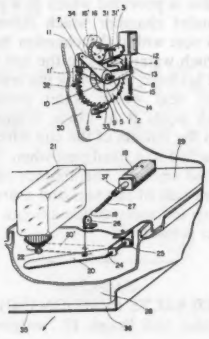
A water valve for an air operated rock drill for controlling the flow of water from a water supply passage to the water feed tube of the drill. The valve is designed to prevent the water pressure from exceeding the air pressure. The valve includes a piston which is acted on by air under pressure to be opened to permit the flow of water from the supply passage to the feed tube. A passage in the valve piston permits the flow of water from the water feed tube to the side of the valve piston opposite from the side which is acted on by the air pressure. If the water pressure exceeds the air pressure, the piston will be moved toward a closed position to prevent the flow of additional water from the supply into the water tube until such time as the water pressure is reduced to a point below that of the air pressure.

3,656,509

AUTOMATIC TONER FEEDING DEVICE FOR ELECTRONIC COPYING MACHINES

Hideo Yasu, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 29, 1971, Ser. No. 110,907
Claims priority, application Japan, Feb. 5, 1970, 45/12077
Int. Cl. B67d *508*
U.S. Cl. 137—560 **2 Claims**



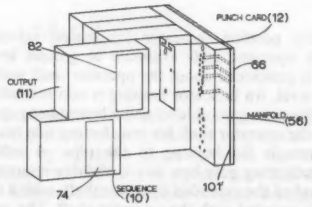
An automatic toner feeding device for electronic copying machines which adds a certain amount of the toner each time a certain number of copying paper sheets are developed. A gear turns in response to the processing of the copying paper, and a toner feeding valve means is actuated at a certain angular position of the gear for adding the toner into a developer tank. The initial angular position of the gear is manually controllable.

3,656,510

FLUIDIC SEQUENCE CONTROLLER

Hans-Dieter Kinner, Duxbury, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Dec. 30, 1969, Ser. No. 889,210
Int. Cl. F15c *1/10*
U.S. Cl. 137—608 **25 Claims**



A sequencing controller, pure fluid device. Modular construction, highly flexible in the nature and complexities of its applications. Uses program punch card forms, fixed with

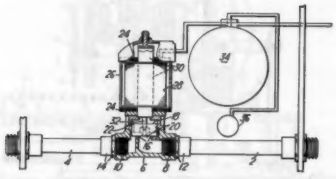
respect to input and output. Operates on the basis of sensor response to actual situation in controlled process or energy. Coincidence device compares controller output and sensor response. Selective sequence station repeater. Multiple manifold unit and punch card structure between sequence and output modules. Plug-in modules, input and output fluidic circuit boards and punch cards readily replaceable, and process or energy sensors flexible in application.

3,656,511

CONTROL APPARATUS FOR AUTOMATIC WATER FLUSHING SYSTEMS

Graham Frank Hood, 2 Halls Road, Biddulph, Stoke-on-Trent, England

Filed Aug. 17, 1970, Ser. No. 64,287
Claims priority, application Great Britain, Aug. 21, 1969, 41,698/69
Int. Cl. E03b
U.S. Cl. 137—624.11 **1 Claim**



The flow of water to a system comprising one or a number of automatically operated flushing cisterns is subject to the control of apparatus fitted on a pipe line leading from a water supply main to the flushing system, the control apparatus comprising a passage through which the water must flow on its way from the main to the system, a valve controlling the flow through the passage, a spring acting to hold the valve normally in an open position, a solenoid device which when energized acts to overcome the action of the spring and close the valve, thereby shutting off the flow of water to the system, and a timing device programming the energization of the solenoid device and governing the periods when the valve will be closed and the water supply to the system shut off, so as to obviate waste of water by unwanted automatic flushing action during off periods.

3,656,512

MIXING VALVE

James H. Countryman, 3324 Trailon Road, Dayton, Ohio

Continuation of application Ser. No. 796,511, Feb. 4, 1965, now abandoned. This application Nov. 9, 1970, Ser. No. 88,227
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.4 **33 Claims**

A deformable valve member having two spaced fluid inlet passageways has an arcuate exit passageway, selected portions of which are opened in response to a deforming force applied to the valve member. Embodiments of one- and two-piece valve members are disclosed.

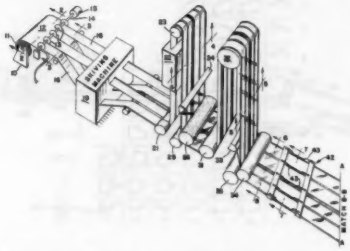
Also disclosed are two single lever faucet constructions embodying a valve member and deforming means therefor.

3,656,513

METHOD OF MANUFACTURING CONTAINER BODIES FROM COMPOSITE STRIP MATERIAL; CONTAINER BODY BLANKS AND CONTAINER BODIES

Raymond J. Evans, Hinsdale, and George L. Reinhardt, Oaklawn, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 31, 1966, Ser. No. 590,658
Int. Cl. F16l *9/16*
U.S. Cl. 138—141 **22 Claims**



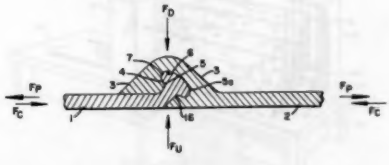
This disclosure relates to a method of manufacturing composite strip material for use in fabricating container bodies by providing a length of strip material having opposite surfaces terminating at parallel side marginal edges, longitudinally severing the strip material to form parallel severed marginal edges, encapsulating the now severed strip material with the thermoplastic material adhering to itself through a space between the severed marginal edges and outboard of the side marginal edges, and longitudinally severing the thermoplastic material in general alignment with said space.

3,656,514

HIGH RELIABILITY JOINT FOR MANUFACTURE OF PIPE

Robert Stickney Kafka, Maitland, Fla., assignor to Julian C. Renfro, Winter Park, Fla., a part interest

Filed Sept. 18, 1968, Ser. No. 773,682
Int. Cl. F16l *13/02*
U.S. Cl. 138—166 **6 Claims**

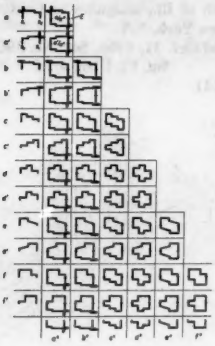


This invention relates to a novel joint particularly well suited for use in the continuous and rapid manufacture of high pressure pipe, tubing or the like. The pipe so manufactured may be made in a wide range of diameters and helix angles, with my novel joint possessing sufficient mechanical strength that unraveling of the pipe joint simply will not occur. For pipes to be manufactured for use underwater or underground, or to carry particularly high pressure, I may additionally utilize brazing material on a continuous basis along the joint, thus assuring against porosity, even under high stress conditions.

3,656,515
SHAPED TUBE

Alfred Wogerbauer, and Rudolf Strasser, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen-und Stahlwerke Aktiengesellschaft, Linz, Austria

Filed June 2, 1970, Ser. No. 42,735
Claims priority, application Austria, June 6, 1969, A 5360/69
Int. Cl. F16l 9/22
U.S. Cl. 138—171 6 Claims

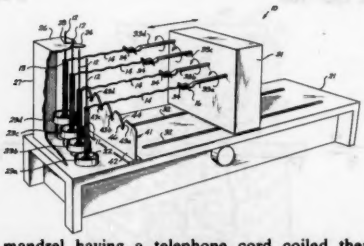


The improvement is in the field of shaped tubes made of component sections joined by butt-welding. A wide variety of shapes including non-symmetrical forms, is rendered feasible according to the invention which provides a shaped tube comprising two component sections having equidistant legs and joined along their facing leg ends by butt-weld seams applied in a common plane on opposite sides of said tube, wherein at least one of the four legs welded together in pairs is differing in length from at least one of the other legs.

3,656,516
METHODS OF AND APPARATUS FOR UNWINDING A HELICALLY WOUND ELONGATED BODY

Edwin C. Hardesty, Perry Hall, Md., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,376
Int. Cl. B21f 7/00
U.S. Cl. 140—149 15 Claims

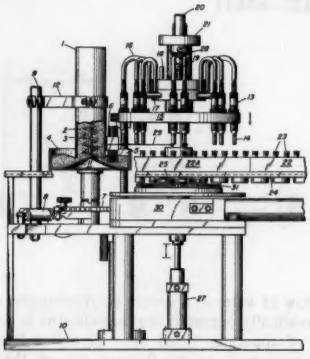


A mandrel having a telephone cord coiled thereon is mounted vertically and rotatably with one end of the cord attached to a spindle mounted rotatably on a reciprocally movable carriage. The carriage is moved relative to the mandrel to uncoil the cord and successive sections of the cord are moved axially horizontally and generally perpendicular to a stationary plate positioned between the mandrel and the carriage at the same time the axis of the cord is moved transversely vertically so that portions of the cord adjacent to the other end thereof are moved into, and pulled through, a slot formed in the plate. Simultaneously, the ends of the cord are twistingly rotated relative to each other to reverse the direction of the helical coil. As the other end of the cord is disengaged from the mandrel, the last few convolutions of the cord spring together and expand radially on the mandrel side of the plate until the other end of the cord engages a pair of spaced pins attached to the mandrel-side of the plate on opposite sides of the slot. The pins retain the last few convolutions of the cord on the mandrel-side of the plate, and the cord is maintained strung between the spindle and the plate to facilitate removal by an operator.

3,656,517
POWDER FILLING MACHINE AND METHOD

Arthur Sinclair Taylor, Spring Valley, and Ellsworth Roland Sandhage, Pearl River, both of N.Y., assignors to Perry Industries Incorporated, Hicksville, L.I., N.Y.

Filed Oct. 20, 1966, Ser. No. 588,202
Int. Cl. B65b 1/16
U.S. Cl. 141—1 10 Claims



A powder filling machine as described in which the powder is introduced into a large vessel, its surface smoothed and the powder raked. The intermittent turntable is provided which can both lower and raise measuring chambers and also move them to different stations one of them being over containers to be filled. In one station the measuring chambers are lowered into the powder and vacuum sucks each full. The chamber provided with a screen so that powder cannot be sucked out of the chamber, a small excess is sucked beyond the bottom of the chamber which is open. The chamber then moves across a string or wire which scrapes off the excess powder. Then the chamber is moved to another station over a container to be filled, lowered in contact with it and connected to gas under pressure which blows the contents of the chamber into the container. The container is advanced bringing another container into loading position and the operations described above are repeated. When loading powder which is explosive or hazardous all metal to metal contact is avoided.

3,656,518
METHOD AND APPARATUS FOR MEASURING AND DISPENSING PREDETERMINED EQUAL AMOUNTS OF POWDERED MATERIAL

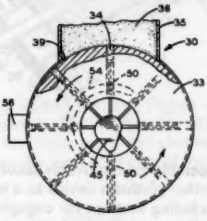
Theodore F. Aronson, Glen Cove, N.Y., assignor to Perry Industries, Inc., Hicksville, N.Y.

Filed Mar. 27, 1967, Ser. No. 626,083
Int. Cl. B65b 1/16
U.S. Cl. 141—1 31 Claims

Measuring and dispensing equal predetermined amounts of powdered material with a measuring chamber having a piston means movably mounted therein for movement between a retracted loading position and a protracted discharging position. The head of the piston means is formed of a porous

material which is pervious to a gaseous medium, but impervious to the powder to be measured and dispensed. Charging of the measuring chamber with a measured amount of powdered material is attained by drawing a vacuum on the chamber when the piston is displaced to a retracted loading position. Dispensing of the measured powder charge from the measuring chamber is attained by effecting displacement of the piston toward a protracted discharging position to push the measured charge of powder in front of the piston out of the measuring chamber. Positive separation of the measured charge from the end of the piston head is attained by applying a force of positive fluid pressure on the end of the piston head in the protracted position to dislodge the powder charge therefrom.

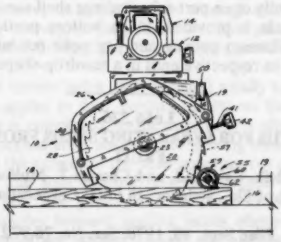
This invention further contemplates the inclusion of a means and step for effecting additional compaction of the



powder charge of evacuated density within the chamber prior to the ejection of the powder charge therefrom. This is attained by positioning the chamber charged with a measured amount of powder at evacuated density adjacent an anvil means, and thereafter effecting displacement of the piston a predetermined amount with controlled pressure to compress the powder charge at evacuated density between the piston head and the anvil means to form a compacted powder slug. The ejection of the compacted powder slug is attained by further advancing the piston head to a protracted or ejected position relative to the chamber, and blowing the slug from the piston head by applying a pulse of positive fluid pressure to the end of the porous piston head.

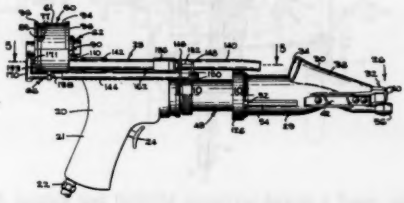
This invention further contemplates various means for enhancing the doctoring of any excess powdered material from the end of a measuring chamber during a vacuum filling or charging operation to assure completely accurate predetermined measurement on each charging operation.

3,656,519
AUXILIARY TOOL DEVICE
James L. Stackhouse, Florissant, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed May 6, 1970, Ser. No. 35,152
Int. Cl. B27g *19/04*
U.S. Cl. 143—159 C **13 Claims**



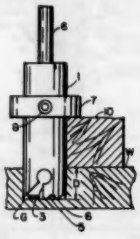
An auxiliary tool device for power driven saw is provided which includes a tool holder carrying a rotatable spreader and pivotal anti-kickback pawls. The holder is mounted to one side of the saw cover and adjustably movable along an arc of a circle having a center at the axis of the saw blade to maintain the spreader and pawls spaced the same distance from the saw blade for each adjusted position thereof.

3,656,520
POWER TOOL AND AUTOMATIC FEED THEREFOR
Giorgio Caffa, Genoa, Italy, assignor to FMC Corporation, San Jose, Calif.
Filed Mar. 30, 1970, Ser. No. 23,637
Int. Cl. B25b *23/04*
U.S. Cl. 144—32 **22 Claims**



A pneumatic power screwdriver has a removable screw filled magazine operably mounted thereon so that screws therein retained are mechanically dislodged one at a time and pneumatically advanced to a chuck assembly forwardly of the screwdriver head. The screw magazine is rotatably driven by a ratchet wheel so that every time a screw is inserted into a work surface the magazine is rotated by an incremental amount to a position whereby an adjacently positioned screw can be advanced on the next screwing operation. The chuck assembly is mounted on the screwdriver for reciprocating movement so that when it is desired to drive a screw into a work surface, the chuck assembly can retract relative to the body of the screwdriver allowing the screwdriver head to protrude therethrough in workable engagement with the screw retained by the chuck assembly.

3,656,521
POWER CHISEL
John F. Czerniewicz, 337 Foch Boulevard, Mineola, N.Y.
Filed June 30, 1970, Ser. No. 51,205
Int. Cl. B27g *13/00;* **B27c** *5/10*
U.S. Cl. 144—219 **4 Claims**



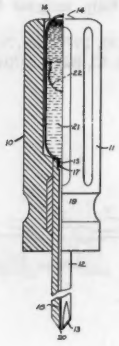
A laterally movable motor driven cutting tool adapted to cut grooves of predetermined depth. The cutting means has a tubular cutting end with a plurality of curved inwardly extending cutting blades formed in said tubular cutting end. Each cutting blade has a cutting spur on its outside edge. A depth adjusting ring and guide means are provided to control the depth and shape of the groove.

3,656,522

SCREWDRIVER WITH NON-SLIP BIT COATING MEANS

Bjorn Rafnar Ingimarsson, C/O Bjorns Airmotive Company, Chehalis, Wash.

Filed Oct. 2, 1970, Ser. No. 77,611
Int. Cl. B25b *15/02*; C09k *3/14*
U.S. Cl. 145—50 A 5 Claims



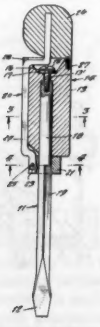
A tool for manually turning a threaded fastener. The example shown is a screwdriver having an integral supply of abrasive fluid stored within its handle. A supply passage extends through the axial tool shank in communication with the fluid supply and leads to an outlet orifice at the operative tip of the tool. By selectively discharging abrasive material at the tip while engaging a fastener such as a screw or similar member, one can effectively increase the frictional engagement between the tool tip and the fastener and thereby permit the application of greater torque without slippage of the tool.

3,656,523

LEVERAGE OPERATED SCREWDRIVER

Andrew T. McGee, 222 Beach 138th Street, Belle Harbor, N.Y.

Filed July 14, 1970, Ser. No. 54,704
Int. Cl. B25g *1/00*
U.S. Cl. 145—61 L 2 Claims



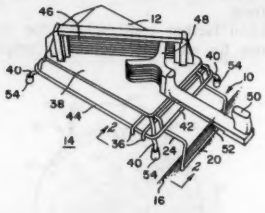
A screwdriver implement, the tool including a straight shank, one end of the shank being flattened to be receivable within a screwdriver slot the other end of the shank having a handle secured thereto, and sidewardly pivotable lever for leverage purpose being movable between a position parallel to the shank and a position at right angle thereto, wherein the handle is rotatable on the shank when the lever is at right angles to the shank.

3,656,524

STABILIZER ASSEMBLY

Clayton E. Giangiulio, Skyline Drive, Malvern, Pa.

Filed Feb. 18, 1970, Ser. No. 12,372
Int. Cl. B26d *3/26*; B23g *3/02*
U.S. Cl. 146—1 R 1 Claim



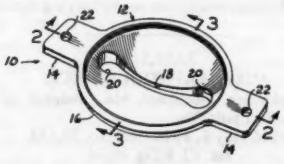
A stabilizer assembly for removably securing a tomato slicing machine or other platform device to a surface, the stabilizer assembly including sections for engaging a wall that lies in a plane generally perpendicular to the plane of the surface upon which the platform device is situated, the assembly further including a straight run and an inclined run which meet in an engaging pocket that receives a portion of a reinforcing bar that is a part of the platform device, with the inclined run then terminating in arms to which is attached at least one cross-rod that has one or more fingers that embrace another portion of the reinforcing bar of the platform device.

3,656,525

EGG SEPARATOR

Everett E. Goodart, 1059 Greenfield Avenue, El Cajon, Calif.

Substitute for application Ser. No. 744,005, July 11, 1968, now abandoned. This application Aug. 11, 1970, Ser. No. 63,032
Int. Cl. A47j *43/14*
U.S. Cl. 146—2 D 2 Claims



An upwardly open part-spherical egg shell contents receiving receptacle is provided, in its bottom portion, with an elongated albumen passing and egg yoke retaining slot terminating at its respective ends in a teardrop-shape.

3,656,526

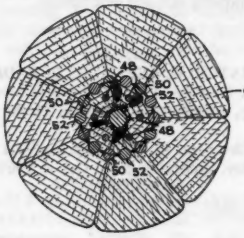
APPARATUS FOR SEPARATING SEEDS FROM CITRUS FRUIT

Wilber C. Belk, Lakeland, and Charles T. Mulford, Auburndale, both of Fla., assignors to FMC Corporation, San Jose, Calif.

Filed Sept. 10, 1970, Ser. No. 70,972
Int. Cl. A23n *3/00*
U.S. Cl. 146—3 N 14 Claims

Seeds are separated from whole citrus fruit, which has been peeled and is retained in a static position, by inserting

around the central core thereof in the region of the fruit seeds a plurality of circumferentially spaced stationary pinching fingers and a plurality of circumferentially spaced oscillating pinching fingers interspaced between the stationary fingers. The oscillating pinching fingers are oscillated in arcuate paths toward and away from the adjacent stationary fingers to pinch the fruits seeds therebetween and thereby separate them from the meat segments of the fruit.

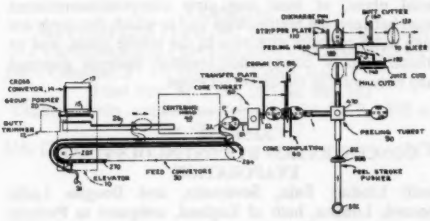


3,656,527

MULTILANE FRUIT PEELING SYSTEM

Leslie Vadas, Los Gatos, and Robert W. Drake, San Jose, both of Calif., assignors to Castle & Cooke, Inc.

Filed July 13, 1970, Ser. No. 54,528
Int. Cl. A23n *3/12, 7/00*
U.S. Cl. 146—238 **25 Claims**



Four pineapples are contour peeled simultaneously fed from a single file elevator conveyor feed system. To accomplish this, the pineapples are picked up from the elevator conveyor, spaced in groups of four and dropped through sliding trap door onto chutes in a group former. The four pineapples are picked up by the pusher fingers of four parallel feeder conveyors and advanced through centering heads. The feeder conveyors then force the four pineapples onto core pins of four core turrets having oppositely projecting core pins.

The core turrets index 180° and shift axially to present the cored pineapples to four peeling turrets on the same axis. The coring is completed on the core turrets after which the cored pineapples are transferred to peeling pins on the core turrets and the crowns of the pineapples are cut off.

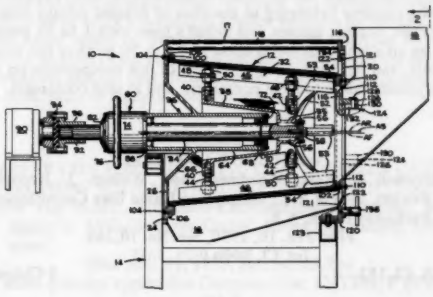
Each of the four peeling turrets has four peeling pins spaced at 90°. The peeling turrets index in 90° steps and bring pineapples beneath peeling heads above the turrets. The pineapples are pushed through the peeling heads from below for contour peeling after which the pineapples are carried across butt end trimmers for disposition by slicing or other processing stations.

3,656,528

PULPING AND FINISHING APPARATUS

Samuel A. Mencacci, Antwerp, Belgium, assignor to International Machinery Corporation S.A., St. Niklaas-Waas, Belgium

Filed Feb. 19, 1970, Ser. No. 12,554
Int. Cl. A23n *3/00*
U.S. Cl. 146—174 **11 Claims**



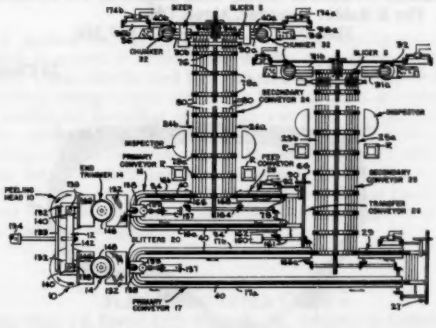
A pulping and finishing apparatus having a frame and a frusto-conical screen which is perforated at least in its lower portion, and which has a driven frusto-conical rotor therein. The rotor is journaled in a cantilever bearing assembly which extends inwardly of the screen from its large end. An end plate is pivotally mounted on the frame at the small end of the screen and may be pivoted between a normally closed position and an open position for ease in removing the screen for cleaning or replacement The screen may be adjusted to place the screen axis either concentric with the rotor axis or eccentric relative thereto. The rotor may also be adjusted so as to affect axial movement of the rotor within the screen during operation thereby varying the spacing between the rotor blades and the screen.

3,656,529

PROCESSING OF CONTOUR PEELED FRUIT HALVES

Leslie Vadas, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 5, 1969, Ser. No. 855,520
Int. Cl. A23n *3/12*; **B26d** *3/26*
U.S. Cl. 146—224 **22 Claims**



Pineapples are cored, contour peeled, trimmed and sliced in half. The halves are immediately guided along different paths by guide ribs fitting the core recesses, and are inspected and sliced while being conveyed along their respective paths.

3,656,530
COMPOUNDING FLUOROCARBONS AND METHOD OF USING SAME

Theodore A. Evans, Akron; Robert M. Meck, and Joseph E. Thibodeau, both of Cuyahoga Falls, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

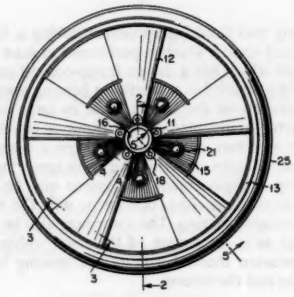
Filed Dec. 19, 1968, Ser. No. 785,388
Int. Cl. B64d *37/02*; **B60p** *3/22*; **B65d** *389/00*
U.S. Cl. 150—0.5 **7 Claims**

This invention relates to a composition of a fluorocarbon and a curative belonging to the class of organic peroxy compounds, organic amines and Schiff's base with 1 to 25 parts of an alkaline earth metal oxide and 1 to 50 parts of red iron oxide, and further relates to the use of this composition on a polyamide fabric to form containers, and to said containers.

3,656,531
WHEEL FOR A VEHICLE

Sherwood B. Ross, Woodmere, and William J. Kreizel, Hewlett, both of N.Y., assignors to Chain Bike Corporation, Rockaway Beach, N.Y.

Filed Feb. 10, 1970, Ser. No. 10,244
Int. Cl. B60b *9/26*, *5/02*
U.S. Cl. 152—8 **5 Claims**

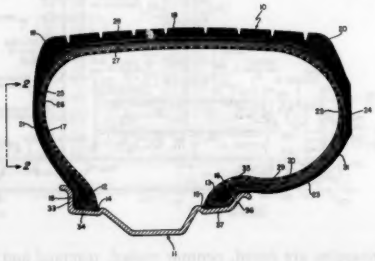


A central hub and concentrically spaced rim, and spokes extending radially between the hub and rim and being internally hollow.

3,656,532
ASYMMETRIC TIRE

Charles W. Roberts, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 22, 1969, Ser. No. 887,246
Int. Cl. B60c *3/00*
U.S. Cl. 152—353 **20 Claims**



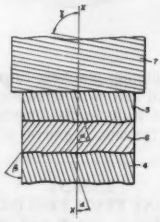
A pneumatic tire having a substantially cylindrical tread portion the centerline of which is offset axially with respect to a pair of bead portions and having a portion of one sidewall only extending primarily in the axial direction outwardly of and from one bead member.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawing and the following detailed description.

3,656,533
MULTI-MATERIAL BREAKERS IN RADIAL TIRES

Carlo Barassi; Giuseppe Lugli, and Mario Mezzanotte, all of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Sept. 17, 1970, Ser. No. 73,112
Claims priority, application Italy, Oct. 4, 1969, 22947 A/69
Int. Cl. B60c *9/18*
U.S. Cl. 152—361 **4 Claims**

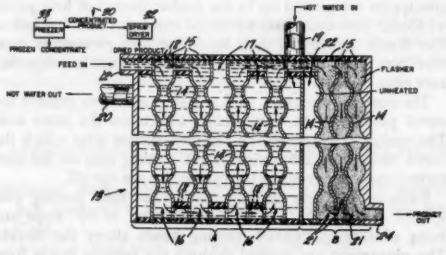


A breaker structure for radial tires includes two or more strips of textile material in which the cords are inclined at a selected angle in one direction relative to the mid-circumferential plane, at least one strip compression-resistant material between the textile strips and in which the cords are inclined in an opposite direction to the textile cords, and an additional strip of compression-resistant material disposed radially outwardly of the aforesaid strips.

3,656,534
CONCENTRATION BY CONTINUOUS FLASH EVAPORATION

Kenneth Lindsay Bain, Sevenoaks, and Douglas Leslie Leonard, London, both of England, assignors to Parkson Corporation, Fort Lauderdale, Fla.

Filed Oct. 29, 1969, Ser. No. 872,075
Claims priority, application Great Britain, May 6, 1969, 23,135/69
Int. Cl. B01d *1/28*, *1/00*; **A23b** *5/02*; **A23f** *1/08*; **B01d** *1/16*; **A23**
U.S. Cl. 159—47 **10 Claims**



In the embodiments of the invention described herein, a liquid such as gelatin or an egg constituent having heat

degradation or fouling tendencies is concentrated by passing it through a plate-type heater while maintaining sufficient pressure to prevent boiling and keeping the temperature of the liquid below the temperature at which the liquid thermally degrades or tends to foul the heating surfaces. The heated liquid is thereafter passed through an unheated portion of the plate heater at reduced pressure, allowing vapor to form, and creating a homogeneous mixture of concentrated liquid and vapor. The concentrated liquid is extracted in a separator, and in the case of egg, may be frozen or spray dried.

3,656,535

CONSUMABLE ELECTRODE MELTING USING A CENTRIFUGAL CAST ELECTRODE

Joseph W. Tommaney, Valencia, Pa., and Francis L. Muscatell, Loudonville, N.Y., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Nov. 5, 1970, Ser. No. 87,335

Int. Cl. B22d *27/02, 13/00*

U.S. Cl. 164—52 **13 Claims**

A method for producing a metal ingot, which comprises the steps of: centrifugally casting metal into a consumable electrode; arranging the consumable electrode within a consumable electrode furnace structure; connecting the consumable electrode to a power supply; melting the consumable electrode in a protective environment by passing electrical current between it and a second electrode; and casting the molten metal into an ingot.

3,656,536

METHOD FOR COOLING THE CAST STRAND IN CURVED-GUIDE CONTINUOUS CASTING PLANTS

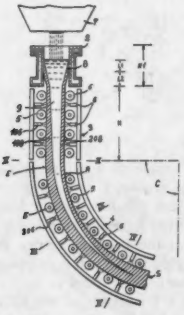
Piero Colombo, 27 Via Leopardi, Udine, Italy

Filed Nov. 26, 1969, Ser. No. 880,101

Claims priority, application Italy, Nov. 28, 1968, 7495 A/68

Int. Cl. B22d *11/12*

U.S. Cl. 164—89 **1 Claim**



In the continuous casting of molten steel into a mold having a vertical casting space, from which the cast metal is passed as a molten core surrounded by a peripheral crust on into a curved guide path section, the improvement comprising cooling, while passing through the straight as well as the curved guide path, that side of the metal which is to form the side of greater radius of curvature more intensively than the opposing side to form a crust of greater thickness, while maintaining an intensity of cooling in the region of the straight guide path section approximately 3 to 7 times greater than the intensity of cooling in the curved guide path section, thereby strengthening the cast metal, and thereafter, after deflection of the cast metal into the curved guide path and while the core is still molten, reversing the differential cooling so as to apply a cooling of greater intensity on the side of the lesser radius of curvature, whereby the solidified crusts along all sides of the cast metal assume substantially the same thickness and the cast metal assumes a symmetrical shape at a point prior to complete solidification.

3,656,537

APPARATUS FOR PRODUCING CONTINUOUSLY CAST SECTIONS WITH AGITATION OF THE LIQUID CORE

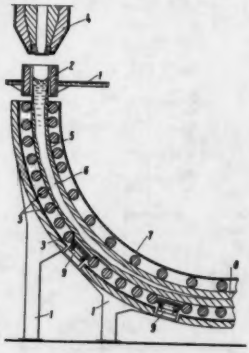
Axel Von Starck, Remscheid-Luttringhausen, Germany, assignor to AEG-Elotherm GmbH, Remscheid-Hasten, Germany

Filed Aug. 11, 1970, Ser. No. 62,794

Claims priority, application Germany, Dec. 12, 1969, P 19 62 341.7

Int. Cl. B22d *27/02, 11/12*

U.S. Cl. 164—251 **5 Claims**



A method and apparatus for continuously casting metal which is poured in molten form into an open ended mold where a thin exterior shell forms about a liquid core and the resulting casting continuously exists from the mold. In order to inhibit the formation of dendrite and other crystals and also concentration of impurities at the center, the cooling casting, after exiting from the mould, moves past a traveling field inductor which generates a traveling electromagnetic field having a component normal to the direction of movement of the casting, this field causing the liquid interior of the casting to be agitated.

3,656,538

FLEXIBLE STARTER BAR

Quin Shen Yu, Forest Hills Borough, Pa., assignor to United States Steel Corporation

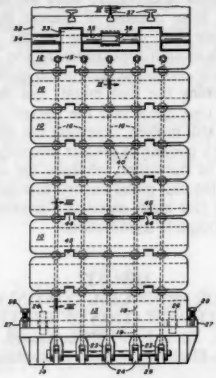
Filed Dec. 30, 1970, Ser. No. 102,586

Int. Cl. B22d *11/08*

U.S. Cl. 164—274 **8 Claims**

A flexible starter bar for use in the continuous-casting of metals. The bar includes a series of blocks and flexible metal

strands connected to the block at the head end of the bar and



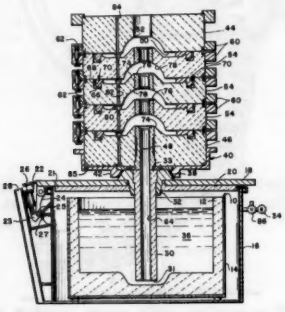
anchored below the tail end. The strands are strung through the other blocks and through ball joints between blocks.

3,656,539

APPARATUS FOR CASTING MOLTEN METAL

Ellis J. Zickefoose, Elmhurst, Ill., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Jan. 29, 1969, Ser. No. 794,974
Int. Cl. B22d *17/06, 27/14*
U.S. Cl. 164—309 **4 Claims**



Molten metal is forced upwardly by bottom pressure casting through an ingate and into the casting cavity of a mold having a dam to retain the metal in the cavity after the ingate has been drained. The mold is preferably formed from separable graphite cope and drag sections and may include an outer cast iron chill ring to impart the desired outer contour to the casting with accuracy. A plurality of such molds may be stacked and filled in one pouring operation.

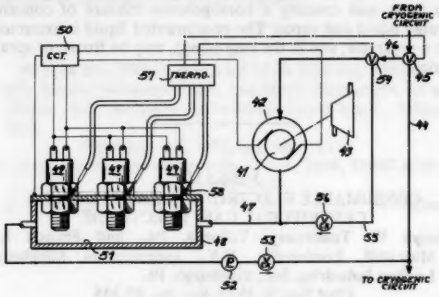
3,656,540

METHOD OF AND SYSTEM FOR DISSIPATING THE HEAT GENERATED BY ELECTRONIC CONTROL DEVICES IN CRYOGENIC INSTALLATIONS

Helmut Henrici, Rodenkirchen, Germany, assignor to Linde Aktiengesellschaft, Hollriegelskreuth, Germany

Filed Nov. 18, 1969, Ser. No. 877,761
Claims priority, application Germany, Nov. 18, 1969, P 18 09 770.6
Int. Cl. F25b *29/00*
U.S. Cl. 165—1 **12 Claims**

A method of and a system for dissipating the heat produced by electronic components, especially motor-control thyristors (silicon-controlled rectifiers) used in motor-control circuits in cryogenic installations. A part of the cooled fluid circulated in the installation is diverted from its circulation or displacement path and used to cool the power thyristors which are employed in frequency inverters and like



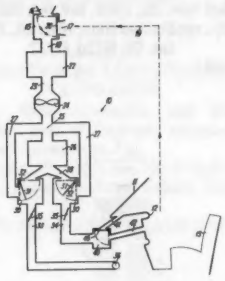
electronic circuitry used to control the speeds of compressor motors of such installations. The thyristor may be mounted in vaporizer or evaporator of the cryogenic installation which preferably is a refrigeration unit or system for the low-temperature rectification of air or other gas mixtures.

3,656,541

VEHICLE AIR CONDITIONING SYSTEM

John Cadden Coyle, Wybunbury, near Nantwich, and Derrick Coulson, Wistaston, both of England, assignors to Rolls-Royce Limited, Derby, England

Filed Jan. 21, 1971, Ser. No. 108,424
Int. Cl. F25b *29/00*
U.S. Cl. 165—16 **16 Claims**

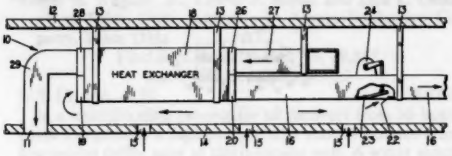


The invention concerns a vehicle air conditioning system comprising an air intake, a refrigerant evaporator, a heater and a heater by-pass conduit, first and second outlet ducting for separately conveying air to respective outlets in the upper and lower parts of the vehicle interior respectively, air-mixing means associated with each said outlet ducting and which is automatically settable to feed to the said outlet ducting air which has passed through the evaporator and selectively through the heater and the heater by-pass conduit, settable mass flow regulating means in each said outlet ducting, air temperature sensing means adapted to measure the air temperature in the respective outlet ducting, the ambient temperature, and the temperature inside the vehicle, and adapted automatically to control the air-mixing means and the mass flow regulating means, means for closing the outlet of the second outlet ducting and diverting the entire output of the system to the first outlet ducting, and a manual device for varying the setting of the said sensing means.

3,656,542
VENTILATING SYSTEM FOR COMPARTMENTED BUILDINGS

William J. Darm, 2201 N. Kellingsworth, Portland, Oreg.

Filed Apr. 23, 1970, Ser. No. 31,137
Int. Cl. F28c 3/02
U.S. Cl. 165—66 9 Claims

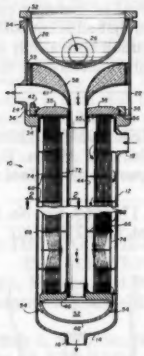


A high efficiency ventilation system for a compartmented building wherein heat from exhaust air removed from a region in the building is transferred, by means of an air-to-air heat exchanger, to fresh supply air being provided to the region, to regulate the delivery temperature of the latter.

3,656,543
LIQUID METAL HEAT EXCHANGER

Walter Wolowodiuk, New Providence, and Tobias Stern, Rockaway, both of N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.

Filed May 25, 1970, Ser. No. 40,036
Int. Cl. F28d 1/06
U.S. Cl. 165—74 9 Claims



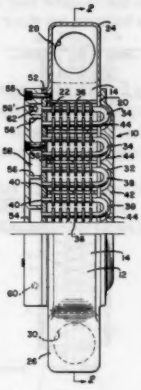
A liquid metal heat exchanger providing for a single pass of primary liquid metal and two passes of secondary liquid metal consisting of a removable core suspended at the top by an annular tube sheet clamped by a bolted ring for convenient removal. A funnel leading into a central downcomer separates cold incoming secondary liquid metal from the relatively hot outgoing secondary liquid metal.

3,656,544
HEAT EXCHANGER

Frank D. Howe, Painted Post, N.Y., assignor to Ingersoll-Rand Company, New York, N.Y.

Filed Aug. 5, 1970, Ser. No. 61,227
Int. Cl. F28d 1/06
U.S. Cl. 165—74 15 Claims

A substantially four-sided housing which forms a chamber therewithin, the housing being open on two opposite sides. A tube nest is replaceably disposed within the chamber, the nest comprising a plurality of coolant tubes each of which tubes has a 180°-bend midway between opposite open ends thereof. A waterhead encloses the open tube ends which are all arrayed at one of the open sides of the housing. The waterhead has inlet and outlet apertures therein for admitting coolant into and from the open tube ends. The housing

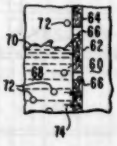


further includes inlet and outlet fluid plenums at either ends thereof with ports therein for admitting and venting fluid to and from the heat exchanger. Also, walls of the exchanger structure have means for directing fluid away therefrom and into the tube nest.

3,656,545
FIBROUS VAPOR COOLING MEANS

Conenraad van Loo, San Jose, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation-in-part of application Ser. No. 668,082, Sept. 15, 1967, now abandoned. This application May 21, 1968, Ser. No. 730,704
Int. Cl. H01j 7/24; F28f 13/00
U.S. Cl. 165—74 13 Claims



Improved means for vapor cooling a surface submersed in a liquid cooling agent, said means comprising a fibrous layer held in intimate relation with the surface. The fibrous layer defines a plurality of spacial paths communicating between opposite sides thereof, said paths comprising interspersed vapor conduits and capillaries. In one embodiment the fibrous layer comprises a plurality of stainless steel fibers spun into yarns which are knitted together into a fabric.

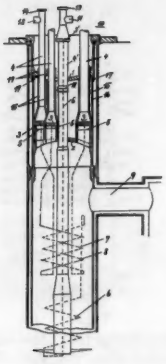
3,656,546
HEAT EXCHANGER STRUCTURE FOR STEAM GENERATORS

Josef Lippitsch, Graz, Austria, assignor to Waagner-Biro AG, Vienna, Austria

Filed June 25, 1969, Ser. No. 836,296
Claims priority, application Austria, June 26, 1968, A 6159/68
Int. Cl. F28f 7/00
U.S. Cl. 165—81 8 Claims

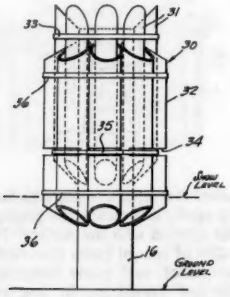
Heat exchanger structure for steam generators to be used with nuclear installations, chemical installations, such as

petrochemical plants and the like. The steam generator has primary and secondary pressure barriers between which connecting pipes extend, and within the latter pipes are heat-



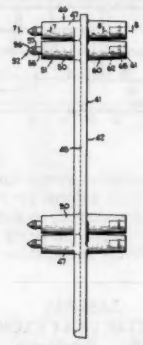
exchanging tubes which extend from tube sheets which are situated within the connecting pipes. At least part of these tube sheets form parts of the primary and secondary pressure barriers.

3,656,547
THERMAL RADIATION SYSTEM FOR SOIL STABILIZER
Winfield G. Beach, 808 Lakeview Trailer Court, Fairbanks, Alaska
Filed May 8, 1970, Ser. No. 35,629
Int. Cl. F28d *15/00*
U.S. Cl. 165—106 **7 Claims**



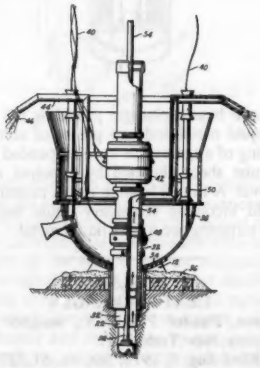
A thermal stabilizer assembly consisting of a vertical tubular convection cell mounted in a body which is to be thermally stabilized, the convection cell being provided with a heat-transmitting fin configuration at its upper portion for heat transmission to the atmosphere. The fin configuration may consist of auxiliary metal tubes clamped to the cell by metal straps. The auxiliary tubes may be arranged in layers. The auxiliary tubes may consist of relatively small auxiliary tubes clamped in relatively large auxiliary tubes, both in heat-conducting contact with the main convection cell. The fin configuration may alternatively consist of flanged vertical bars clamped around the vertical convection cell by metal straps.

3,656,548
SELF-POSITIONING BAFFLE FOR SHELL AND TUBE HEAT EXCHANGERS
Desmond M. Donaldson, Oakville, Ontario, Canada, assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Apr. 23, 1970, Ser. No. 31,338
Int. Cl. F28f *9/22*
U.S. Cl. 165—159 **26 Claims**



A shell and tube heat exchanger including a plurality of transverse baffle plates which may be made of a resilient formable organic compound, the baffle plate adapted to be disposed within the shell and includes positioning means associated with the baffle plate axially projecting from at least one side thereof adapted to matingly engage an axially adjacent baffle plate such that adjacent baffle plates are spaced in a relatively fixed position both axially and rotationally with respect to each other and a method for making same.

3,656,549
UNDERWATER COMPLETION SYSTEM
Marvin L. Holbert, Jr., and Milton T. Childress, both of Houston, Tex., assignors to Gray Tool Company, Houston, Tex.
Filed Sept. 17, 1969, Ser. No. 858,765
Int. Cl. E21b *43/01*
U.S. Cl. 166—.5 **3 Claims**



The guide base installed as an initial step in drilling an underwater well includes an upwardly opening generally hemispherical shell. Later, during christmas tree installation or work-over operations a man-carrying chamber is lowered to mate with the shell. Sealing between the chamber and the shell is accomplished using axially spaced inflatable toric cir-

cumferential seal elements carried exteriorly of the lower end of the chamber and expansible into sealing contact with the shell.

3,656,550

FORMING A BARRIER BETWEEN ZONES IN WATERFLOODING

Ovner R. Wagner, Jr.; Lowell R. Smith, and Jack L. Osborn, all of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Sept. 8, 1970, Ser. No. 70,557
Int. Cl. E21b *33/138*, *43/22*
U.S. Cl. 166—270 9 Claims

In a waterflooding process for oil recovery from oil-bearing earth formations, a high-permeability zone is isolated from a low-permeability zone at the injection well. A water solution of sodium silicate is injected into one zone, a water solution of an activator — a chemical such as ammonium sulfate which causes sodium silicate solution to gel — being injected into the other zone. Preferably, the two solutions are injected simultaneously, the rates of injection being proportional to the pore volumes of the two zones to keep the solution fronts together. Fracturing pressures are avoided.

3,656,551

PREVENTING SCALE ADHERENCE IN OIL WELLS

Jerry W. Biles, Tulsa, Okla., assignor to Cities Service Oil Company

Filed Apr. 20, 1970, Ser. No. 30,327
Int. Cl. C02b *5/00*; C23f *11/14*; E21b *43/25*
U.S. Cl. 166—279 11 Claims

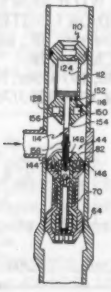
The wellbore, fractures, and adjacent matrices are soaked with solutions of aliphatic amines for several hours, after which they are pushed by a slug of solvent into the formation matrix. Subsequently, normal production is resumed. This treatment prevents scale accumulation on the treated surfaces, whereas untreated surfaces will accumulate copious quantities of the precipitating solid. The chemical nature of the treating compound is such that the compound tends to migrate from the treatment solution to the solid surfaces in the wellbore, fractures, and formation matrices, thereby giving treatment which prevents scale buildup which, if it were not prevented, would decrease the rate of oil production.

3,656,552

METHOD FOR THROUGH-THE-FLOWLINE TOOL INSTALLATION

Floyd M. Pollock, Jr., Houston, and William J. Neal, Manvel, both of Tex., assignors to Shell Oil Company, New York, N.Y.

Filed July 6, 1970, Ser. No. 52,322
Int. Cl. E21b *23/04*, *43/00*
U.S. Cl. 166—315 5 Claims



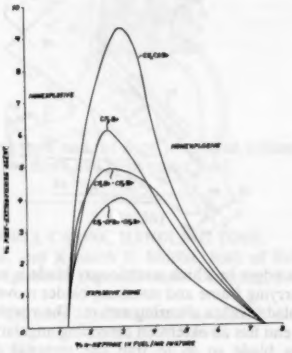
There is disclosed a method and apparatus for placing and removing a retrievable tool in a well conduit. The tool is placed by pumping it down the well conduit to a landing area where it is latched in place. The tool is retrieved by pumping a retrieving tool into the conduit into engagement with the retrievable tool and unlatching the retrievable tool with the retrieving tool. The two tools latched together are pumped up the conduit, and the retrieving tool is then disengaged from the retrievable tool when an elevation of lower pressure is reached and both tools are pumped out of the conduit.

3,656,553

FLAME-EXTINGUISHING SUBSTANCE COMPRISING 1,2-DIBROMOHEXAFLUROPROPANE

Nicholino Rainaldi, Mestre, and Pierluigi Fatutto, Venezia, both of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed May 13, 1970, Ser. No. 36,937
Claims priority, application Italy, May 16, 1969, 16892 A/69
Int. Cl. A62c *1/14*; A62d *1/00*
U.S. Cl. 169—1 A 5 Claims



A flame-estinguishing composition, especially for extinguishing fire upon a body of water, gasoline fires and hydrocarbon-fuel fires consisting at least in part of 1,2-dibromohexafluoropropane.

3,656,554

LAWN EDGE TRIMMER BLADE

William A. Buhner, 320 Harvey Street at Hollywood, Daytona Beach, Fla.

Filed Mar. 10, 1970, Ser. No. 18,141
Int. Cl. A01b *45/00*
U.S. Cl. 172—14 8 Claims

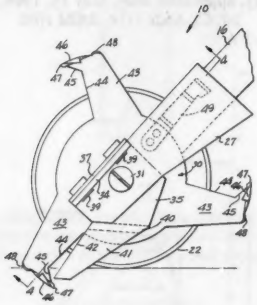
A lawn edge trimmer having a cutting blade mounted on an arbor connected with the drive shaft of the machine. The

blade is provided with a hub portion mounted on the arbor or drive shaft and has opposite end portions curved outward relative to the axis of rotation thereof to create a desireable contour shape at the edge of a lawn or around a sprinkler head, etc.

3,656,555
LAWN EDGER

Elvy E. Johns, Sr., 770 19th Street. S.E., Salem, Oreg.; Elvy E. Johns, Jr., 3150 Jack St. N., Salem, Oreg., and Jerry E. Johns, Eastern Washington State College, Cheney, Wash.

Filed Mar. 27, 1970, Ser. No. 23,374
Int. Cl. A01b *45/00*
U.S. Cl. 172—16 **5 Claims**

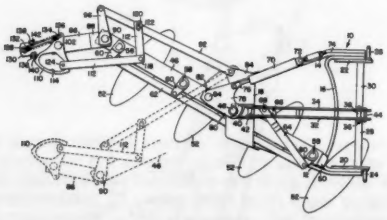


A lawn edger in which a stationary blade is mounted on a motor carrying frame and revolving blades move past the stationary blade with a shearing action. The revolving blade at its outer end has an extension extending angularly toward the stationary blade so as to trap the material to be cut to prevent it from sliding off of the stationary blade. The revolving blade carriers a digger for opening a narrow trench along side of the walk or object along which edging is being done and a cleaner is positioned so as to clean out dirt from the digger which may have become lodged therein.

3,656,556
REVERSIBLE DISK PLOW

Bruno Bernhardt Johannsen, Moline, and Robert Earl Cox, Rock Island, both of Ill., assignors to Deere & Company, Moline, Ill.

Filed Oct. 20, 1969, Ser. No. 867,821
Int. Cl. A01b *3/40*
U.S. Cl. 172—212 **11 Claims**

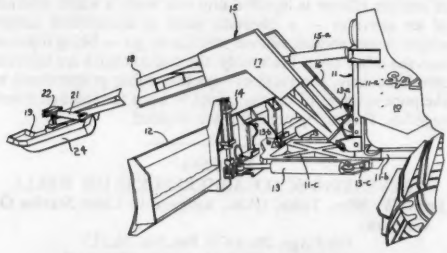


A reversible disk plow having a main frame and a tool-carrying subframe mounted intermediate its ends on a rear end portion of the main frame for lateral swinging movement about a vertical axis between alternate right- and left-hand plowing positions. An offset rear furrow wheel is carried by a mounting frame which is mounted on the rear end of a subframe for lateral swinging movement about a vertical axis between alternate right- and left-hand plowing positions. Linkage means are provided for swinging the mounting frame between its alternate plowing positions and to reverse the furrow wheel as the subframe is swung between its alternate plowing positions.

3,656,557
APPARATUS FOR LEVELLING, SMOOTHING, AND GRADING SNOW

Ross W. Eskelson, Smithfield, and James S. Johnson, Logan, both of Utah, assignors to Thiokol Chemical Corporation, Bristol, Pa.

Filed Aug. 12, 1969, Ser. No. 849,403
Int. Cl. A01b *59/048*
U.S. Cl. 172—277 **5 Claims**

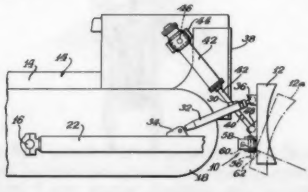


A device is disclosed for use with a vehicle, preferably of the track laying type which is adaptable for traversing, under low bearing pressure conditions, areas and surfaces of snow, mud, sand and other off-highway media of low density, which by virtue of its unique construction and association with the vehicle, enhances remarkably the steering capability thereof. Further, when used on a vehicle which is equipped with a grading plow for grading the surfaces being traversed, enhances the capability of the vehicle to perform grading and leveling operations with great precision not heretofore possible. The device comprises a boom-like frame mounted on the front of the vehicle and formed so as to extend over and above the grading plow and terminating in a steering ski at a point substantially forwardly of the vehicle. The ski, adjustably hinged to the boom-frame, is capable of (1) being raised above the surface being traversed (2) maintaining sliding contact therewith and (3) transmitting a downward force supplied by a control means connecting the boom-frame to the vehicle.

3,656,558
BULLDOZER FRAME WITH ARM STRESS EQUALIZER AND/OR LIMITER

Kenneth J. Kolinger, Riverside, Ill., assignor to International Harvester Company, Chicago, Ill.

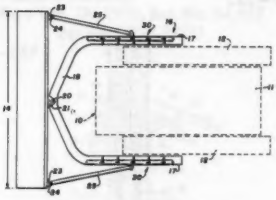
Filed Oct. 30, 1970, Ser. No. 85,523
Int. Cl. C02f *3/76*
U.S. Cl. 172—803 **9 Claims**



Stress reducer in tiltable, diagonal strut braced, bulldozer blade mountings, comprising an intervening link having

horizontally spaced apart portions of the link proper universally connected to the inner end of different ones of the diagonal struts, and having a prolongation to the link proper rendering the latter swingable toward and from the bulldozer blade. The prolongation is horizontally disposed, is at one end of the link proper, and extends diagonally forwardly away from the struts and the one end of the link proper. Although not symmetrical because of the offset brace connection to the blade, the geometry selected nevertheless insures equalization of side-load-imposed stress in the so-called push arms provided for mounting the blade, and further insures limitation of stress in the push arms when, under the special circumstance of an imposed side load condition and a tilted blade condition, the tilt induced stress then tends to be additively superimposed in one of the already side-stressed push arms.

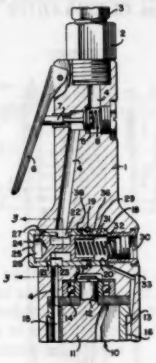
3,656,559
BLADE ANGLING DEVICE
Robert W. Lennea, R.R. 1, and Robert H. Heavenor, 135 Rockland Road, both of Campbell River, B.C., Canada
Filed May 18, 1970, Ser. No. 38,000
Int. Cl. E02f *3/76*
U.S. Cl. 172—805 **7 Claims**



A device having guide tubes which are mountable on slide members of a C-frame connecting a blade to a bulldozer. Slide blocks are mounted in the guide tubes and bracing arms, which extend rearwardly from corners of the blade, are pivotally secured to the slide blocks. The guide tubes and slide blocks both have holes which are placed in registration wen a locating pin is inserted in the path of a slide block as the block is moved along its guide tube in response to movement of the blade to the required angular setting. Locking bars associated with the two locating pins provided with the device are then inserted through registering holes to lock the slide blocks within the guide tubes and to support the bulldozer blade in a selected angular position.

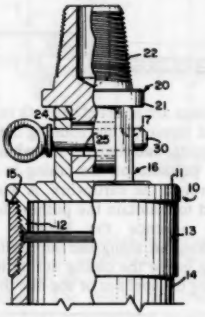
3,656,560
AUTOMATIC SHUT-OFF VALVE FOR POWER TOOL
Robert J. Catterfeld, Sayre, Pa., and David W. Tibbott, Phillipsburg, N.J., assignors to Ingersoll-Rand Company, New York, N.Y.
Filed Sept. 29, 1970, Ser. No. 76,382
Int. Cl. B25b *23/14*
U.S. Cl. 173—12 **9 Claims**

A fluid-actuated shut-off valve for a fluid-powered tool such as a wrench including a spool valve urged to open position by a spring and having respective valve-operating surfaces subject to both inlet and exhaust pressures in the tool. The valve operating surfaces and spring are arranged so the valve is thrown to its closed position by a combination of the



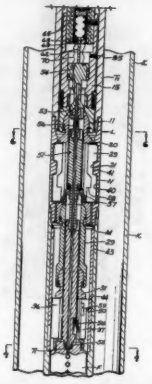
rise in inlet pressure and the drop in exhaust pressure as the tool motor slows down and stalls under load.

3,656,561
WELL CASING HANDLING TOOL
Samuel Leven, and Kenneth S. Moffitt, both of Bridgeport, W. Va., assignors to Ingersoll-Rand Company, New York, N.Y.
Filed May 25, 1970, Ser. No. 41,137
Int. Cl. E21b *19/16*
U.S. Cl. 173—163 **5 Claims**



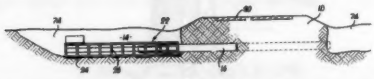
A handling tool used for inserting a well casing pipe into a previously drilled hole such as a water well hole. The tool is designed to be used with the machine which is used to drill the well. The tool includes a first coupling end which can be connected to the rotary head of a drilling machine and a second coupling member which can be connected to the casing pipe to be inserted in the previously drilled hole. The two coupling parts are pivotally connected to each other. The pivotal connection allows the casing pipe to be aligned with the hole in which it is to be inserted. The tool transfers longitudinal and rotary movement from the rotary head to the casing pipe.

3,656,562
WELL PERFORATOR WITH POSITIONING TOOL
Hollis A. Baugh, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.
Filed July 13, 1970, Ser. No. 54,164
Int. Cl. E21b *43/119*
U.S. Cl. 175—4.51 4 Claims



A tool string of the "pump-down" type including a well perforator in combination with locator and orienting devices for assuring aiming of the perforating charges in a predetermined direction and actuation of the firing mechanism only when the perforator has attained the predetermined aiming direction.

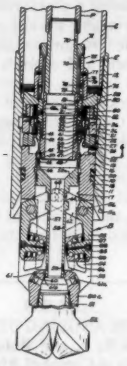
3,656,563
APPARATUS AND METHOD FOR INSERTING CASING BENEATH ROADBEDS
Charles F. Blinne, P.O. Box 445, Poplar Bluff, Mo.
Filed Feb. 16, 1970, Ser. No. 11,749
Int. Cl. E21b *11/02*; E21c *19/00*
U.S. Cl. 175—22 5 Claims



Tubular casings are inserted beneath roadbeds by hammering on one end thereof, while rotating the casing to drive cutters at the opposite end thereof, and while maintaining a constant push or pressure on the casing in its direction of advancement through the earthwork. A winch-cable-pulley assembly is used to maintain the pushing force, such assembly operating to advance the hammer and the rotating mechanism along an elongated supporting frame structure. Dirt collecting inside the casing during insertion is removed prior to running of pipelines or the like through the casing.

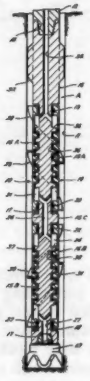
3,656,564
APPARATUS FOR ROTARY DRILLING OF WELLS USING CASING AS THE DRILL PIPE
Cicero C. Brown, c/o Brown Oil Tools, Inc. P.O. Box 19236, Houston, Tex.
Continuation-in-part of application Ser. No. 778,509, Nov. 25, 1968, now Patent No. 3,552,507, and a continuation-in-part of 803,911, Mar. 3, 1969, now Patent No. 3,552,508, and a continuation-in-part of 857,046, Sept. 11, 1969, now Patent No. 3,552,509, and a continuation-in-part of 864,747, Oct. 8, 1969, now Patent No. 3,552,510. This application Dec. 3, 1970, Ser. No. 94,909
Int. Cl. E21b *9/26*
U.S. Cl. 175—228 8 Claims

A drilling system employing casing as drill pipe and a bit assembly which is bodily insertible and removable through



the casing and releasably attachable thereto for rotation with the casing.

3,656,565
ROTARY DRILLING TOOL
Fred K. Fox, 11220 Smithdale, Houston, Tex.
Filed Sept. 23, 1970, Ser. No. 74,546
Int. Cl. E21b *17/00*
U.S. Cl. 175—323 6 Claims

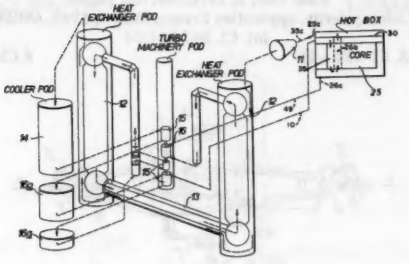


A rotary drilling tool comprising a member connectable in a tubular drill string for rotation with it, and a body about the member having spiral blades about its outer side. The tool fluidly connects with the bore in the drill string above and below it to conduct drilling mud downwardly to and out the bit, and the body is rotated relative to the member and in a direction to cause the blades to reduce the hydrostatic pressure of the drilling mud in the lower end of the well bore below the blades.

3,656,566
GAS COOLED NUCLEAR REACTOR INSTALLATION
Geoffrey Coast, Northwich, and Vernon Morgan, Culcheth, near Warrington, both of England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Oct. 3, 1968, Ser. No. 764,707
Claims priority, application Great Britain, Oct. 27, 1967, 49,056/67
Int. Cl. G21d *5/00*
U.S. Cl. 176—59 4 Claims

In a gas cooled nuclear reactor, especially one wherein the coolant is compressed, heated, and expanded through a heat

utilisation plant, prior to entry to the nuclear reactor, that is one wherein the reactor is used for reheat, the moderator is



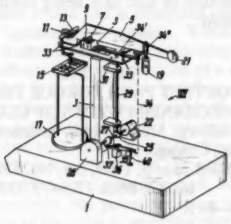
cooled by a bleed by passing part of the compressor. The moderator coolant ducts are preferably convergent step wise in the direction of coolant flow through them.

3,656,567

PRECISION BALANCE WITH AUTOMATIC LOCKING DEVICE

Erich Emil Knothe, Gehrenring, and Ludwig Weickhardt, Bovenden, both of Germany, assignors to Sartorius-Werke GmbH (und vormals Gottinger Prazisionswaagenfabrik GmbH), Gottingen, Germany

Filed Oct. 28, 1970, Ser. No. 84,655
Int. Cl. G01g *23/02*
U.S. Cl. 177—155 **5 Claims**



The invention relates to balances with a balance beam having bearings and consisting of knife-edges and pans, that must be protected against shock-like loads. A locking device permits the lifting of the bearing knife-edges from the bearing pans. In addition to a locking position and an unlocking position, there is provided a special position where the knife-edges and pans are engaged for a preliminary weighing for the purpose of selecting the weights to be added or removed. There are provided three command switches that actuate a driving motor by means of a control circuit, the motor providing the possibility of bringing the balance into each of the three operating positions. In this connection, care is taken that the balance can be shifted from the special position into the unlocking position and inversely only by passing through the locking position so that in the meantime the knife-edges must necessarily be separated from the pans.

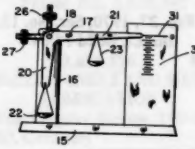
3,656,568

VARIABLE BALANCE-POINT COUNTING DEVICE

Sid Hejzlar; Robert M. Zweig, both of Flushing, N.Y., and Goerge D. Reynolds, Jr., New Canaan, Conn., assignors to John Chatillon Division of Macrodyne-Chatillon Corporation, Kew Gardens, N.Y.

Filed Feb. 18, 1971, Ser. No. 116,515
Int. Cl. G01g *19/00*
U.S. Cl. 177—200 **8 Claims**

A counting device is provided for counting statistically uniform manufactured parts, by weight, using a self-balancing scale with a variable balance-point. A known number of parts similar to those to be counted is placed on the balancing unit of a vertical balancing arm and the unknown quantity placed in the counting unit on an opposing horizontal arm. The design principle used is such that when balance equilibri-



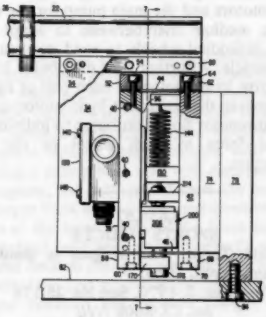
um is reached, the vertical component of downward deflection of the horizontal arm bears a direct linear relationship to the proportionate weights, and so numbers, in the two pans. Modifications serve to enhance accuracy through reduction of friction and automatic read-out.

3,656,569

WEIGHING APPARATUS

Clarence Johnson, 31649 Trillium Trail, Pepper Pike, Cleveland, Ohio

Filed Sept. 22, 1970, Ser. No. 74,300
Int. Cl. G01g *3/08, 3/12, 3/18*
U.S. Cl. 177—210 **19 Claims**



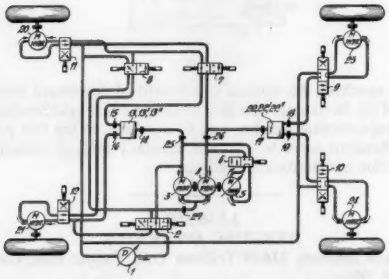
A cantilevered flexure spring weighing apparatus in which a load-receiving structure is supported on the free ends of upper and lower, vertically spaced apart, cantilever mounted flexure spring members. The flexure members, which are flexed by the applied load to provide a weight-representing deflection of the load-receiving structure, are respectively placed in tension and compression when the load is off center whereby a structure rigidly interconnecting the free flexure member ends is turned slightly about an axis relative to a relatively stationary support that mounts the flexure members. A transducer having coacting relatively movable, signal producing parts respectively connected to the interconnecting structure and the flexure member support, measures the weight representing deflection at a location that is at least closely adjacent to a predetermined center of integrity where the relative angular displacement of the interconnecting structure does not impart any significant signal producing relative motion to the coacting transducer parts. Other features of this invention pertain to a tare adjustment and a temperature compensating construction, among other things.

3,656,570

HYDROSTATIC DRIVE ARRANGEMENT FOR VEHICLES WITH AUTOMATIC ADAPTATION OF CIRCUMFERENTIAL FORCES AND WHEEL SPEEDS TO FRICTION AND CURVATURE CONDITIONS

Franc Gortnar; Zarko Zalokar; Fedor Klun; Olga Zalokar, and Velena Bulog-Gortnar, all of Ljubljana, Yugoslavia, assignors to Strojna Tovarna Trbovlje, Vodenska, Trbovlje, Yugoslavia

Filed Feb. 27, 1970, Ser. No. 15,138
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 18 Claims



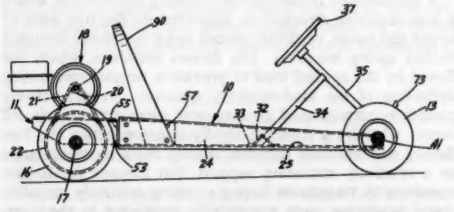
A hydrostatic drive for a vehicle having front and rear wheels with respective driving hydromotors connected to the corresponding right and left wheels, respectively. A main hydraulic pump is connected in hydraulic circuit with the hydromotors while a hydromotor flow distributor lies in circuit the hydromotors and the main pump for the distribution of a hydraulic medium therebetween to adapt the rotary speeds of the individual wheels to road curvature encountered by the vehicle. A further flow distributor is connected between the drive hydromotors of each pair of right and left wheels, and between the respective hydromotors and the corresponding hydromotor flow distributor to individually adapt circumferential force at each wheel to the respective road/wheel friction.

3,656,571

SPORTS VEHICLE

Neal R. Canfield, Trego, Wis., assignor to Stanley W. Tull Co., Inc., Minneapolis, Minn.

Filed Apr. 2, 1970, Ser. No. 25,178
Int. Cl. B60k *5/10*
U.S. Cl. 180—11 7 Claims



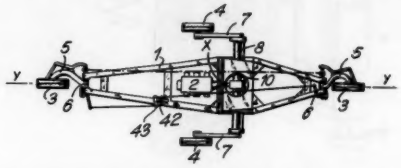
A miniature low-clearance, ground-hugging four-wheeled sports cart for racing and other recreational purposes. The cart is characterized by sheet metal frame construction and variable clearance accomplished by readily separable and exchangeable engine and rear axle and wheel mounts, and readily separable and exchangeable front wheel mounts. The cart can be readily converted from standard to racing height and from standard to racing engine, or vice versa, in a matter of minutes.

3,656,572

VEHICLES WITH INCIDENCE-ANGLE DRIVING WHEELS

Pierre Ernest Mercier, 1, Route de Saint-Brice, Piscop, France

Filed Mar. 4, 1970, Ser. No. 16,300
Claims priority, application France, Mar. 4, 1969, 6905804
Int. Cl. B62d *61/04*
U.S. Cl. 180—21 6 Claims



A vehicle comprising steering wheels, driving wheels distinct therefrom and supporting most of the total weight of the vehicle, and means for swivelling said driving wheels through equal angles to either side of their positions parallel to the longitudinal axis of the vehicle, said means being controlled by a servomechanism comprising a transverse acceleration sensor.

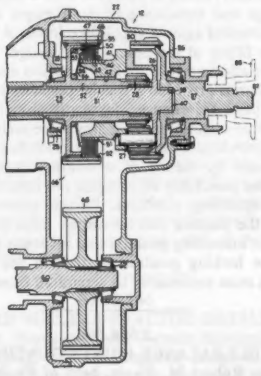
The vehicle includes an axle carrying the driving wheels and mounted for pivotal motion in relation to the chassis about an axis lying in the longitudinal vertical plane of symmetry of the chassis and passing through a transmission joint, the pivotal motion of said axle being controlled by the said servomechanism.

3,656,573

PLURAL OUTPUT PATH TORQUE TRANSMITTING MECHANISM WITH SLIP CLUTCH

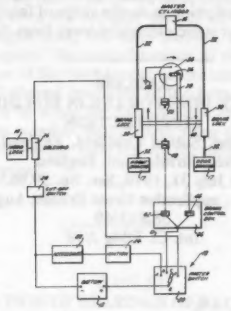
Robert W. Halberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed June 5, 1969, Ser. No. 830,752
Int. Cl. B60k *17/34, 17/20*
U.S. Cl. 180—44 R 5 Claims



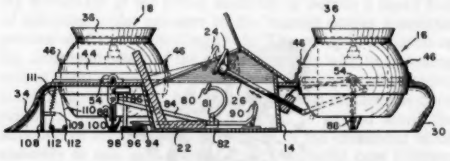
A multiple path drive system for a vehicle having plural pairs of traction wheels including a torque transfer mechanism adapted to receive an input torque which incorporates a differential gear mechanism driven by the input torque and adapted to distribute the input torque to a plurality of drive axles and a friction clutch mechanism which acts to resist relative rotation between the drive axles.

3,656,574
VEHICLE LOCKING CIRCUIT
Joseph Edwards, 8822 Fourth Avenue, North Bergen, N.J.
Filed July 13, 1970, Ser. No. 54,153
Int. Cl. B60r *25/00*
U.S. Cl. 180—114 12 Claims



A circuit is disclosed for locking and unlocking the brakes, ignition and hood of a vehicle so as to secure it from theft. A key-operated master switch is effective in its plurality of positions to: (a) open the ignition-power source circuit; (b) energize a circuit to unlock a normally closed hood lock; (c) energize a circuit which effects the opening and closing of brake locks; and (d) open all electrical circuits of the vehicle. The ignition of the vehicle is connected to the power source via the master switch and is energized only when that switch is in the "ignition on" position. When the master switch is in the brake locking and unlocking position, a secondary switch effects selective actuation of a motor; when the secondary switch is in the "brake lock" position, a half stroke of the motor closes brake locks, and in the "brake unlock" position, the completed stroke of the motor opens the brake locks. The hood lock, being normally closed, is opened when the master switch is in the "hood unlock" position due to the energization of the hood unlock circuit. In the remaining master switch position, the power source is isolated from all electrical circuits of the vehicle, ensuring that the ignition, hood and brakes all remain locked during the absence of the owner or user from the vehicle.

3,656,575
GROUND EFFECT MACHINE
George W. Vryland, 1510 Monmouth Drive, Richmond, Va.
Filed June 30, 1970, Ser. No. 51,301
Int. Cl. B60v *1/14*
U.S. Cl. 180—120 9 Claims

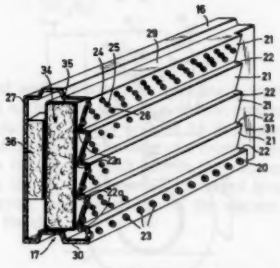


A ground-effect machine having a rigid outer plenum chamber which is substantially triangular and has an inverted, cup-shaped form. The two leading sides of the plenum chamber adjacent the bow have inwardly inclined sides which serve to increase stability, provide a slight lift force, and reduce the hydraulic coefficient of discharge, which in turn increases the lift of the vehicle above the ground surface. Three spherical propulsion units are mounted on and extend above the plenum chamber. They are provided with a substantially universal mounting on the plenum chamber and their position is controlled from a cockpit on the plenum chamber.

ERRATUM

For Class 181—5 A see:
Patent No. 3,656,585

3,656,576
NOISE SHIELD PANELS AND METHOD OF FABRICATION
Gunter Gubela, Poll-Vingster Strasse 150-160, 5 Koln Kalk (5 Cologne-Kulk), Germany
Filed Apr. 15, 1971, Ser. No. 134,157
Claims priority, application Italy, Nov. 19, 1970, 13039 A/70
Int. Cl. E04h *17/00*; B64f *1/26*; E04b *1/82*
U.S. Cl. 181—33 G 28 Claims

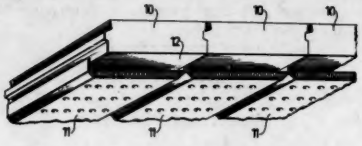


A hollow, rectangular plastic casing and a sheathed sound absorbing material batt forming a sound absorbing panel; as a panel casing noise source facing front wall, an echelon of four forwardly inclined integral step-like faces, each with three off-set series of longitudinally spaced outwardly-flanged apertures, and a bottom straight margin with a single, like aperture series; a casing back wall with alternating raised and depressed regions; the batt spaced from the back by fibrous blocks or deeper back depressions; end closures and opposed vertical flats at the lateral ends of the front and back walls; and a longitudinal land and complementarily shaped groove in the top and bottom casing walls, whereby like panels are insertable with land and groove engagements and with panel ends engaged between the opposed flanges of respective spaced H-beam uprights optionally. A panel edge-surrounding impregnated sealing band, forming a seal concealed in the tongue-and-groove engagement of adjacent panels. A noise fence comprising spaced H-beams thus filled with interposed panels and capped by inverted U-channels. Casing fabrication in one piece by blow-molding from heated extruded thermoplastic tubular stock; or by vacuum forming, injection molding, centrifugal or rotational casing as front and back halves to be partially telescoped and welded or cemented together.

3,656,577
CEILING OR FLOORING ELEMENT OF LIGHTWEIGHT CONCRETE
Ingemar Larsson, Orebro, and Karl-Gustav Ohrn, Kumla, both of Sweden, assignors to Intong AB, Hallabrottet, Sweden
Filed Dec. 1, 1969, Ser. No. 881,130
Int. Cl. E04b *1/86*
U.S. Cl. 181—33 G 3 Claims

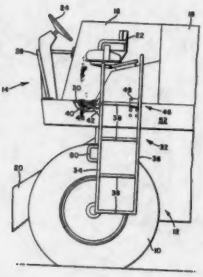
In a ceiling or flooring element of concrete or lightweight concrete the improvement of providing the underside of the

element with a box containing a porous sound insulating material to secure sound insulation. The box may be fixed by



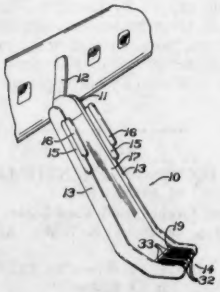
means of two side-pieces and two flanges put in grooves in the element.

3,656,578
VEHICLE ACCESS LADDER
Peter Chauncey Hemken, Le Claire, Iowa, assignor to Deere & Company, Moline, Ill.
Filed Nov. 2, 1970, Ser. No. 86,111
Int. Cl. E06c *5/04*
U.S. Cl. 182—20 **12 Claims**



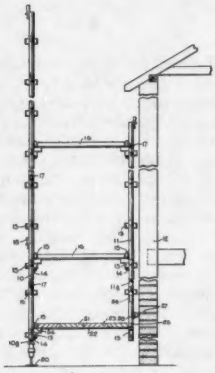
An access ladder for the elevated operator's platform of a vehicle, the ladder being swingably mounted on the platform for movement between a first position wherein the ladder extends vertically downwardly from the access side of the platform, and a second position wherein the ladder extends horizontally across the access side of the platform and serves as a guard rail therefor. A latch mechanism on the platform retains the ladder in either position.

3,656,579
FRICTION PANEL
John M. Fisher, Cuyahoga Falls, and Kenneth E. Paige, Akron, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.
Filed Sept. 8, 1970, Ser. No. 70,316
Int. Cl. A62b *1/20*
U.S. Cl. 182—48 **9 Claims**



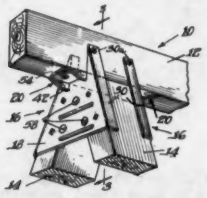
A deceleration panel for the lower section of an aircraft escape slide to control the sliding speed of passengers leaving an aircraft in which longitudinal strips of rubber having a nonskid surface are mounted on strips of fabric supporting material for resisting sliding in the dry condition. The strips of fabric are fastened to a layer of three-dimensional fabric having stiff loops for draining away any water and projecting out of the water to resist sliding in the wet condition. The three-dimensional fabric is mounted on a backing member of fabric supporting material which has a coating of conductive material on the underside as do the strips of fabric supporting materialto conduct static electricity away from the panel.

3,656,580
SCAFFOLDING FOR USE IN BUILDING CONSTRUCTION
Peter Eric Gostling, Sutton Coldfield, England, assignor to Kwikform Limited, Birmingham, England
Filed July 31, 1970, Ser. No. 59,963
Claims priority, application Great Britain, Aug. 2, 1969, 38,813/69
Int. Cl. E04g *3/08*
U.S. Cl. 182—82 **3 Claims**



A platform supporting transom element of scaffolding, provided at one end with a wedge connection to a vertical scaffold tube, and at the other end with a wall engaging lug spaced above platform level.

3,656,581
SAWHORSE BRACKET ASSEMBLY
Charles O. Larson, Sterling, Ill., assignor to Charles O. Larson Co., Sterling, Ill.
Filed Mar. 30, 1970, Ser. No. 23,739
Int. Cl. F16m *11/00;* **E04g** *1/32*
U.S. Cl. 182—224 **1 Claim**



A bracket assembly for use in the formation of a sawhorse or the like structure. The assembly includes a main support bracket having a generally triangular face plate with a slot of a predetermined width extending inwardly from the apex

thereof and a shelf portion extending outwardly from a first surface of the face plate at the base of the slot; and an auxiliary bracket mounted on the main bracket. The auxiliary bracket includes a plate portion having a width at least at a predetermined point therealong equal to the width of the slot in the main bracket and being received thereat in the slot. A first section of the plate portion extends from the first surface of the face plate and rests on the shelf portion. A second section extends from the opposite surface of the face plate and includes flanges along the sides thereof, the ends of which are butted against the second surface of the face plate. The cross member of the sawhorse structure rests on the auxiliary bracket and aligned apertures in the latter and in the shelf portion serve to allow for the insertion of a screw fastener into the cross member. Side flanges along the face plate have apertures at the upper ends thereof for passage of screws into the cross member.

3,656,582

LUBRICATION OF BEARINGS OF RECIPROCATING ENGINES OR PUMPS

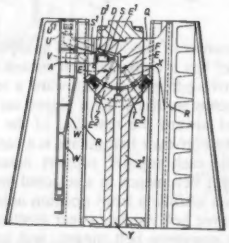
John Forster Alcock, Lancing, England, assignor to Ricardo & Co. Engineers (1927) Limited, Shoreham-by-Sea, Sussex, England

Original application Aug. 15, 1968, Ser. No. 752,967, now Patent No. 3,545,569. Divided and this application Apr. 29, 1970, Ser. No. 32,999

Claims priority, application Great Britain, Aug. 16, 1967, 37,812/67

Int. Cl. F01m *1/02*

U.S. Cl. 184—6.5 **5 Claims**



A reciprocating piston mechanism in which the piston or piston rod is pivotally connected by a small end bearing to an angularly oscillating connecting rod and which includes a displacement type lubricating pump actuated independently of the oscillation of the connecting rod by the linear reciprocating movement of the piston assembly to deliver a timed feed of lubricant under pressure to the bearing during a selected portion of the reciprocating cycle. The pump is mounted on the crosshead block of the piston assembly with its operating axis at right angles to the direction to reciprocating movement of the piston and is actuated by a cam mechanism comprising a linear cam fixedly mounted to extend along the direction of reciprocating movement of the crosshead block assembly to one side thereof, and a movable cam follower carried by the cross head block assembly and acting on the pump plunger to actuate the pump, the cam follower being caused to ride along the fixed cam by the linear reciprocating movement of the piston assembly. A telescopic supply pipe supplies lubricant to the pump inlet, and also to thebig end bearing of the connecting rod via a longitudinal passage formed in the connecting rod.

3,656,583

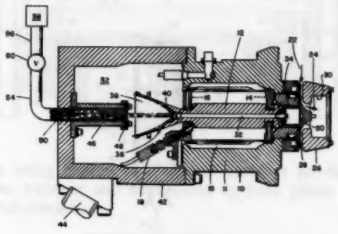
METHOD AND APPARATUS FOR PRODUCING A TORQUE LOAD ON A SHAFT

Clarence J. Hornbeck, Wescosville, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sept. 2, 1969, Ser. No. 854,607

Int. Cl. F16n *1/00*

U.S. Cl. 184—6.11 **10 Claims**



A method and apparatus for creating a work load on a driven shaft such as the shaft of a turbine used to liquefy gas by expansion. The load is created by impinging a jet of a viscous fluid on the inner surface of a receptacle provided on the shaft so that as the shaft rotates the viscous fluid is expelled from the receptacle at an increased level of kinetic energy. Varying the rate of flow of the viscous fluid varies the load on the shaft.

3,656,584

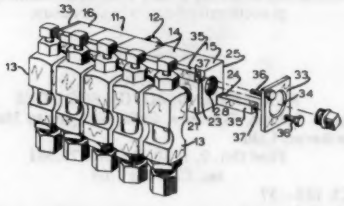
LUBRICANT MANIFOLD ASSEMBLY

Frank J. Lyden, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.

Filed Oct. 14, 1969, Ser. No. 866,319

Int. Cl. F16n *7/06*

U.S. Cl. 184—7 R **7 Claims**



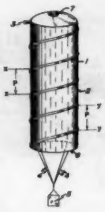
A manifold assembly is disclosed for the distribution of lubricant to a plurality of lubricators. The manifold includes a plurality of blocks arranged in series or in end to end relation longitudinally. Each block is provided with a longitudinally extending bore with the bores of the respective blocks being axially aligned and in communication with each other to form a manifold distribution passage. An inlet to the distribution passage is provided in one of the blocks and an outlet communicating with the distribution passage is provided in each of the blocks. A plurality of lubricators corresponding to the number of blocks are supplied from the distribution passage through corresponding coupling means which are secured in the outlets of the respective blocks and support the lubricators.

3,656,585

EXPLOSIVE ECHO RANGING DEVICE

Adlay B. Andrews, Woodbury, N.J.; David L. Coursen, Newark, Del., and Frank A. Loving, Jr., Wenonah, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 13,385, Mar. 7, 1960, abandoned.
Filed Apr. 23, 1963, Ser. No. 275,464
Int. Cl. G10k 11/00
U.S. Cl. 181—0.5 A 5 Claims



A sonic-pulse-producing assembly for use in underwater echo ranging which comprises

a. a linear charge of detonating explosive arrayed in the form of a helix having a uniform pitch, P, which satisfies the relationship

$$P \leq 0.75 \times C/D \times L$$

where D is the detonation velocity of said explosive, L is the length of explosive in each turn of said helix, and C is the velocity of sound in sea water, said linear charge being so arrayed that the closest approach of explosive in successive turns of said helix is no less than the minimum cross-sectional dimension of said linear charge;

b. supporting means adapted to maintain said explosive in said helical array; and

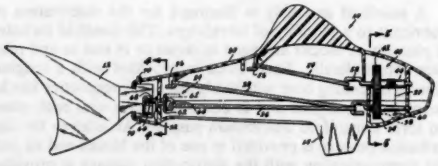
c. an initiator in initiating relationship to one end of said explosive, said initiator being adapted to be actuated by a self-contained actuating means when said assembly is at a predetermined depth in the ocean.

3,656,586

RUBBER BAND MOTOR FOR TOYS

George E. Robson, Torrance, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Oct. 9, 1970, Ser. No. 79,381
Int. Cl. F03g 1/04
U.S. Cl. 185—37 6 Claims



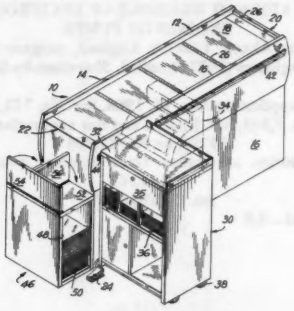
A rubber band motor which utilizes a long length of band material in a relatively short toy housing and which enables rapid winding of the band, comprising a first rubber band extending between a rotatable output member and a first gear and a second rubber band extending between a second gear and a stationary bracket. The two gears are normally engaged so that the rubber bands are connected in series to drive the rotatable output member. A winding gear moves into engagement with the first and second gears while separating them from each other when the rubber bands are being wound, so that the winding gear winds both rubber bands simultaneously, i.e., in parallel. When winding forces are no longer applied to the winding gear, it disengages from the first and second gears and allows them to re-engage so that they unwind in series. The motor is useful in a water toy with a flapping tail that propels it through the water while carrying a figure representing a man whose arms engage a pair of fins on the vehicle.

3,656,587

CHECKOUT COUNTERS

Joel S. Siegel, 229 East 79th Street, New York, N.Y.

Filed May 25, 1970, Ser. No. 40,141
Int. Cl. E04h 3/04
U.S. Cl. 186—1 A 7 Claims



A checkout counter of the type used in supermarkets. The checkout counter has a conveyor belt means provided with an upper run moving from a front toward a rear end of the conveyor belt means so that articles placed on the upper run will be conveyed toward the rear end of the conveyor belt means. Beside the conveyor belt means is a cash register support means. This cash register support means is movable along the conveyor belt means to a selected one of a number of positions which include a front position adjacent the front end of the conveyor belt means, a rear position adjacent the rear end of the conveyor belt means, and an intermediate position between the ends of the conveyor belt means. At the front position the cash register support positions a cash register for use during transfer of articles directly from a cart onto the front end of the conveyor belt means. At the rear position the register is available for use during express checkout operations. In the intermediate position the cash register is located for use during unloading of a cart situated beside the conveyor belt means between the ends thereof.

3,656,588

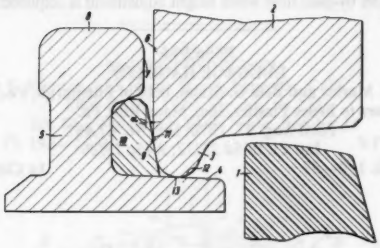
RUBBER TRACK BRAKE

Franz Preinfalk, Langenfeld; Dietmar Ulbricht, Dinslaken, and Friedrich Rohrsen, Rodenberg, all of Germany, assignors to August Thyssen-Hutte Aktiengesellschaft, Duisburg-Hamborn, Germany

Filed May 19, 1970, Ser. No. 38,812
Claims priority, application Germany, May 23, 1969, P 19 26 358.2
358.2; Dec. 9, 1969, P 19 61 604.7
Int. Cl. B61k 7/02
U.S. Cl. 188—62 6 Claims

The invention relates to a rubber track brake wherein each steel rail is provided with an element having an inclined sur-

face projecting laterally inwardly so that the flange of a vehicle wheel contacts the surface at only a single point close to the foot of the rail, thereby minimizing friction even as the wheel moves up the surface somewhat under the influence of centrifugal force as when going around a curve.



3,656,589

SPOT TYPE DISC BRAKES

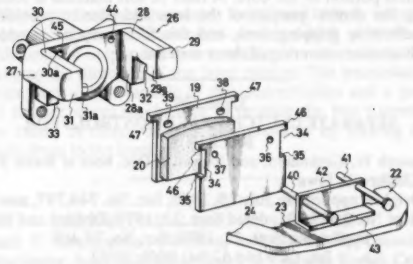
Tsuneo Kawabe, Hekikai Gun, and Toyoaki Kobayashi, Toyohashi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 5, 1970, Ser. No. 34,677

Claims priority, application Japan, May 10, 1969, 44/43020; May 13, 1969, 44/43717

Int. Cl. F16d *55/228*

U.S. Cl. 188—72.5 **4 Claims**



A spot type disc brake for wheels wherein a hydraulic cylinder housing has at each side a torque-receiving arm comprising a projection extending above and across a brake disc of the outer end the lower half of the projection being cut away or recessed to permit an one inner edge of a reaction transfer plate to move thereinto below the projection.

3,656,590

CALIPER DISC BRAKE AND RESILIENT MOUNTING MEANS THEREFOR

Charles Newstead, Walsall, England, assignor to Girling Limited, Tyseley, Birmingham, England

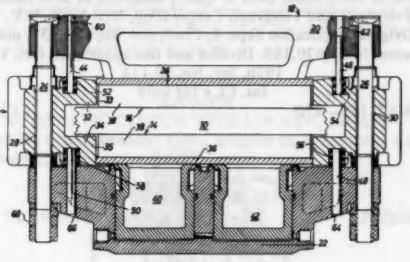
Filed June 19, 1967, Ser. No. 646,890

Claims priority, application Great Britain, June 18, 1966, 27,317/66

Int. Cl. F16d *55/224*

U.S. Cl. 188—73.4 **8 Claims**

The invention relates to a reaction type caliper disc brake with a fabricated yoke or clamping member movable relative to a stationary torque carrier member adapted for fixing to a vehicle. The clamping member comprises a pair of chordal beams connected by tie rods passing through clearance holes in the carrier member and is supported on the carrier member by resilient bush and pin assemblies, compression of the resilient bushes during circumferential movement of the clamping member produced by friction forces in a braking operation being limited by abutment surfaces provided on the carrier member and engageable by back plates of the friction pad assemblies.



3,656,591

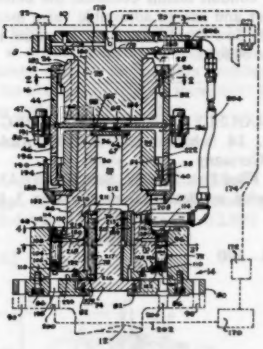
ONE-WAY SELF-ALINING TORQUE UNIT

Joseph A. Marland, Hinsdale, and Charles W. Hill, La Grange, both of Ill., assignors to Marland One-Way Clutch Co., Inc., La Grange, Ill.

Continuation-in-part of application Ser. No. 827,400, May 23, 1969, which is a continuation-in-part of application Ser. No. 737,965, June 18, 1968, now abandoned. This application Sept. 4, 1970, Ser. No. 69,584

Int. Cl. F16d *63/00*

U.S. Cl. 188—82.84 **12 Claims**



A one-way, self-alining torque unit well suited for heavy duty on a vertical shaft subject to misalinement with respect to coacting torque applying structure. The unit comprises a one-way torque coupling and an alinement coupling integrated together for mounting on a vertical shaft and providing for compensation for misalinement of the shaft with reference to coacting structure which applies torque to the shaft in only one direction through the assembly. Working parts of the alinement coupling and underlying working parts of the torque coupling are continuously bathed in flowing lubricant that descends through a succession of comating working parts all to the end that the unit will operate reliably for many years in locations where access for service is impractical. A reversible cam ring in the unit permits adaption of the unit to transmit torque to the shaft in either direction without structural modification of components of the unit. Interfitting toothed rings accommodate misalinement of the shaft and minimize the overall length of the unit.

3,656,592

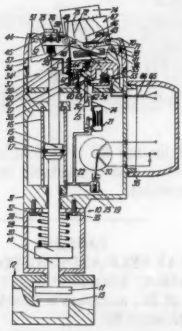
ADJUSTABLE DASH POT AND ACTUATING MEANS THEREFOR

William Fredrick Keller, Covina, and Frank Francis Domyan, North Hollywood, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Original application Sept. 8, 1969, Ser. No. 855,937, now Patent No. 3,620,185. Divided and this application Oct. 12, 1970, Ser. No. 80,114

Int. Cl. F16f 9/04

U.S. Cl. 188—270 1 Claim



An hydraulic system having calibration, bandwidth, and dash pot controls with indicators for each, and a dash pot adjustment. The dash pot includes a corrugated bellows closed at one end and open at the other end to receive a conduit means. The conduit means connects the bellows to a fluid tight chamber and has an adjustable valve means therein to regulate fluid flow therethrough. Arm means is provided to compress the bellows.

3,656,593

CONTINUOUSLY ADJUSTABLE LIFTING DEVICES

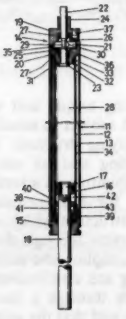
Fritz Bauer, 14 Schulzstrasse, D-8503, Altdorf near Nuremberg, Germany

Filed Dec. 2, 1969, Ser. No. 881,436

Claims priority, application Germany, Dec. 3, 1968, P 18 12 282.2

Int. Cl. F16f 9/32

U.S. Cl. 188—300 6 Claims



The invention provides a lifting device or displacement controlling and locking device for height adjustment of table tops and other members. The device comprises a double tubular housing having in the inner tube a piston the position of which is controllable and lockable by controlling flow of fluid from one side of the piston to the other through a by-pass passage provided between the inner and outer tubes. A blocking device at one end of the housing is operable to allow the by-pass flow when height adjustment is required.

3,656,594

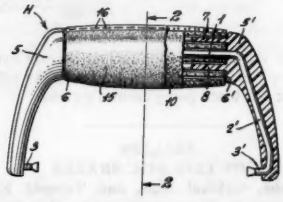
LUGGAGE HANDLES

Lou F. Marks, and Bela G. Szabo, both of Pittsburgh, Pa., assignors to Bruce Plastics, Inc., Moon Run, Pa.

Filed Aug. 27, 1970, Ser. No. 67,492

Int. Cl. B65d 25/32; A45c 13/26

U.S. Cl. 190—57 14 Claims



A composite luggage handle formed of a bail-shaped reenforcing core of rigid material having a central portion and two lateral legs diverging from the ends thereof which terminate in mounting pintles. The legs of the core are covered with molded bodies of hard plastic material and runner bars of the same plastic material of reduced section extend between the ends of the molded bodies in addition to the central portion of the core. A filler of soft material is folded onto the central portion of the bars and core to provide a comfortable gripping area, and this filler may be provided with an outer covering of sheet material.

3,656,595

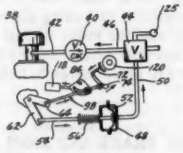
SEPARATE CLUTCH-BRAKE CONTROLS FOR BACKHOE

Kenneth W. Gethmann, and Russell J. Dye, both of Route #1, Gladbrook, Iowa

Original application July 15, 1968, Ser. No. 744,797, now Patent No. 3,529,701, dated Sept. 22, 1970. Divided and this application Sept. 22, 1970, Ser. No. 74,460

Int. Cl. F16d 67/04; B60k 29/02

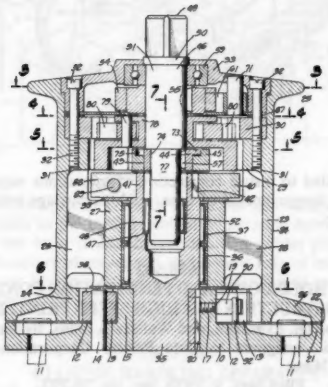
U.S. Cl. 192—13 R 5 Claims



A clutch and brake means for a backhoe adapted to permit the operator to disengage the clutch while simultaneously applying the backhoe brakes. The backhoe intake manifold is connected to a vacuum operated control means by means of a vacuum line in which is interposed a valve means. The vacuum operated control means includes a vacuum chamber having a diaphragm movably mounted therein which is connected to a rod extending therefrom. The rod has a spring means connected thereto which resists the movement of the rod in one direction when the valve is operated to apply a vacuum on the diaphragm. The rod is connected to a linkage which is connected to the clutch-brake pedal so that when a vacuum is applied to the diaphragm, the clutch is engaged

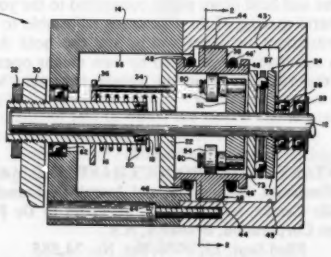
while the brake is disengaged. When the vacuum is removed from the diaphragm, the spring means on the rod causes the rod to move the linkage so that the pedal is depressed thereby disengaging the clutch and applying the brakes on the backhoe.

3,656,596
MULTISPEED WINCH
John S. Morgan, 123 Jasper Street, Leucadia, Calif.
Filed Dec. 2, 1970, Ser. No. 94,231
Int. Cl. F16d *67/02*; F16h *29/04*; B66d *1/24*
U.S. Cl. 192—17 R **9 Claims**



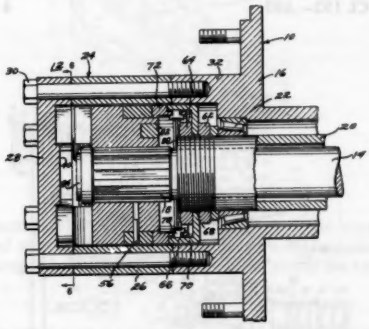
There is disclosed herein a multispeed winch using a mechanical power transmission device which provides a unidirectional output and two transmission ratios selected by changing the direction of the input motion. The transmission device uses a cam capable of two eccentricities and a pawl and ratchet wheel mechanism to provide the two transmission ratios. A direct drive is also provided by locking the winch drum to the input shaft.

3,656,597
FREE-RUNNING TWO WAY CLUTCH
Frank P. Gruchmann, Pittsford, and Gordon F. Connelly, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 20, 1970, Ser. No. 65,550
Int. Cl. F16d *13/16*, *13/04*
U.S. Cl. 192—35 **2 Claims**



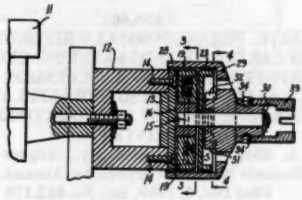
A free-running two way clutch having a drive element and a driven member and comprised of a plurality of rollers rotatable with the driving element and disposed against the inner periphery of a plurality of cam segments distributed about the driving element. The outer surfaces of the cam segments are brought into engagement with the driven member when a rotational motion is imparted to the rollers by the driving element. The symmetrical design of the cam segments permits bi-directional operation. An interface member having high static and low dynamic friction laterally abuts the cam segments. Engagement of the drive element and the driven member is facilitated because of the special frictional properties of the interface member.

3,656,598
AUTOMATIC CLUTCH WITH LOCKING MEANS
Ralph W. Goble, Boulder, Colo., assignor to Autometrics Co., Boulder, Colo.
Filed Aug. 28, 1970, Ser. No. 67,833
Int. Cl. F16d *11/00*, *41/04*
U.S. Cl. 192—35 **22 Claims**



Reversible clutch which engages and locks a driving member and a driven member upon relative movement between the driven member and another member and which disengages in the absence of relative movement between the driving member and the other member.

3,656,599
CENTRIFUGAL CLUTCH
Thomas M. Diggs, 1349 Otis Street, N.E., Washington, D.C.
Filed Aug. 11, 1970, Ser. No. 62,908
Int. Cl. F16d *13/04*
U.S. Cl. 192—42 **4 Claims**



A centrifugal clutch mechanism operating with the drive shaft or flywheel of a small motor of a hobby vehicle (boat, car, etc.) or power tool and on the driven shaft of the same types of equipment for the purposes of torque transmission control with adjustability. It includes two centrifugally operated weights, counterpoised against springs, which press against a clutch drum with increasing force as the rotational speed increases. At low speeds the springs maintain the weights out of engagement with the drum. As the speed increases the weights come in contact with the clutch drum to

drive the drum. In order to start the engine by hand or otherwise turning the driven shaft a pair of low speed automatically releasing pawls are provided for engagement with an annular ratchet.

In one form of the invention the clutch is attached to the flywheel or drive shaft of the mechanism and in another form it is attached to the driven shaft.

3,656,600

INCHING CLUTCH WITH BRAKE AND ACCELERATION CONTROLS

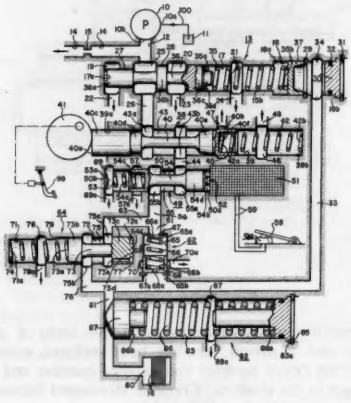
Shin Kitano; Yutaka Momose; Kazuo Ishikawa, and Takashi Hida, all of Kariya City, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya City, Japan

Filed May 5, 1970, Ser. No. 34,777

Claims priority, application Japan, May 7, 1969, 44/36667

Int. Cl. B60k *21/00, 29/00*

U.S. Cl. 192—.055 **4 Claims**



This invention relates to a clutch oil pressure control mechanism of the wet type. The improvements comprise means provided for automatically causing the clutch engagement on-off control to respond to movements of a conventional accelerator pedal or brake pedal so as to easily obtain no clutch or half-clutch engagement in an easier way and for substantially obviating conventional clutch-engaging shocks.

3,656,601

PNEUMATIC PHRASE/FORMAT WRITER UTILIZING CARD CARTRIDGE AND FEATURING CYCLICAL MECHANISM FOR READING A SUCCESSION OF CARDS AS WELL AS PROGRAMMING THE TABULATION AND OTHER FUNCTIONS OF AN INTERCONNECTED PRINTER

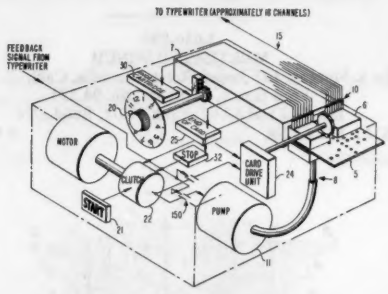
William A. Abell, Jr., Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,178

Int. Cl. B41j *5/36*

U.S. Cl. 197—20 **2 Claims**

The present invention involves a pneumatic card handling unit accommodating a cartridge with a plurality of cards therein having information in the form of coded perforations that are pneumatically sensed. The unit includes means operable during successive cycles to withdraw individual cards in succession from the cartridge, read the information, and return the cards to the cartridge. A printing means such as "Selectric" typewriter (IBM registered trademark) is interconnected by a pneumatic cable with the card reading unit for printing of information automatically under control of the card unit. The system further includes means for controlling tabulation functions of the printer according to diverse program cards during the printing process. Also, interlock means



are provided to insure completion of operations requiring a relatively longer period of time, such as carriage return and tabulation.

3,656,602

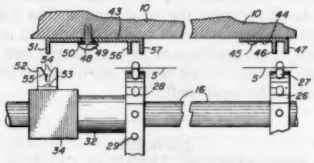
PAPER HOLD DOWN AND PENETRATION CONTROL CONSTRUCTION FOR HIGH SPEED PRINTERS

Joseph Konkel, Lynnfield, and Wallace J. Satas, Hudson, both of Mass., assignors to Data Printer Corporation, Cambridge, Mass.

Filed Sept. 9, 1970, Ser. No. 70,792

Int. Cl. B41j *11/34*

U.S. Cl. 197—133 P **9 Claims**



A paper hold down and penetration control for high speed printers in which the print drum is carried on a yoke pivotally attached to the frame in which the hammers are supported, comprising adjustable means for controlling the nearest approach of the print drum to the hammers, and a paper feed and hold down assembly comprising tractors mounted on the main frame and hold down plates connected to the yoke.

The lateral spacing of the tractors is adjustable to accommodate variations in paper width, and the hold down assembly is automatically adjusted by cam means operated by pivoting the yoke, to maintain proper alignment with the tractors.

3,656,603

ALIMENTARY PASTE PRODUCT HANDLING MACHINE

Ignatius Bontempi, Douglaston, and Joseph De Francisci, Jr., Rockville Centre, both of N.Y., assignors to De Francisci Machine Corporation, Brooklyn, N.Y.

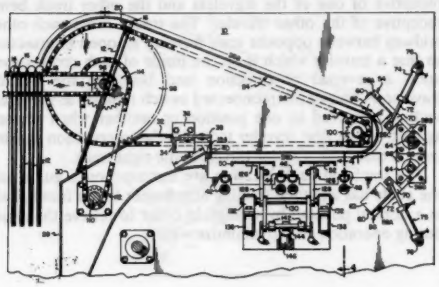
Filed Sept. 23, 1970, Ser. No. 74,585

Int. Cl. B65g *47/00*

U.S. Cl. 198—20 **12 Claims**

A long alimentary paste product handling machine for stripping dried strands of the paste product from drying sticks and for conveying the stripped strands to a cutting station is described. A clamping device grasps the heads (the U-

shaped portions) of the paste product strands as a hook on a continuous conveyor engages the supporting end of a drying stick and removes it from between the legs of the clamped strands. A pair of spaced tables which support the stripped strands transfer the strands to conveyors which are positioned between and beneath the tables and which transport the strands to the cutting station by pivoting downwardly to below the level of the conveyors. The tables pivot in the same direction of travel and at the same rate of travel as the conveyors in order to minimize transfer forces and thereby reduce breakage.



3,656,604

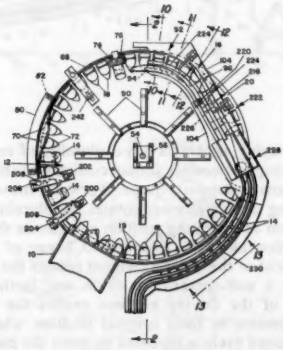
CLOSURE HANDLING APPARATUS

Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Filed Mar. 16, 1970, Ser. No. 19,998

Int. Cl. B65g *47/24*

U.S. Cl. 198—33 AA **11 Claims**



Closure handling apparatus designed to effect orientation of elongated cylindrical closures which are greater in length than in diameter and in which the closed end is heavier than the open end. Closures are received in radially arranged pockets in either an oriented or non-oriented position, provision being made for rejecting from their pockets the non-oriented closures.

3,656,605

APPARATUS FOR ORIENTING AND FEEDING CAPS

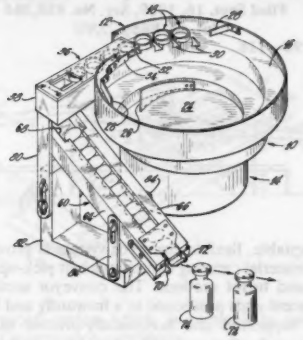
Larry C. Gess, 10523 Orchard Street, Samaria, Mich.

Filed June 5, 1970, Ser. No. 43,833

Int. Cl. B65g *11/20*, *47/24*

U.S. Cl. 198—33 AA **8 Claims**

This invention relates to apparatus for orienting and feeding caps to bottles. The caps are oriented in a inverted position and are then moved along a predetermined path to an opening located mostly along one side of the path. When the caps reach the opening, they tilt and fall down a chute and are directed to an inclined track therebelow. The caps are received right side up on the track and are fed sequentially therealong to bottles moving below a lower end of the track.



3,656,606

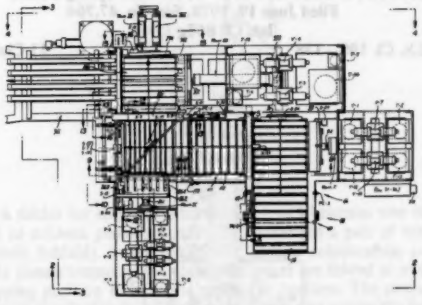
APPARATUS FOR HANDLING BLOCK-LIKE ARTICLES

Alfred E. Comstock, Frontenac, Minn., and Burdsal Gardner Wilcox, Oakland, Calif., assignors to Safeway Stores, Incorporated, Oakland, Calif.

Original application Nov. 29, 1968, Ser. No. 779,734, which is a division of application Ser. No. 402,746, Oct. 9, 1964, now Patent No. 3,433,278, dated Mar. 18, 1969. Divided and this application Apr. 30, 1970, Ser. No. 33,405

Int. Cl. B65g *21/26*

U.S. Cl. 198—34 **10 Claims**

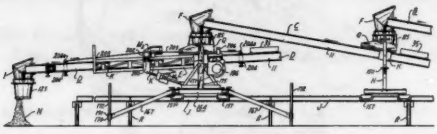


Apparatus for handling block-like articles having first and second conveyor means, including means controlled by the first conveyor means for causing parts to be delivered by the second conveyor means to the first conveyor means at spaced intervals so that the parts are advanced onto and carried on the first conveyor means at spaced intervals with at least certain of the parts on the second conveyor means being disposed one immediately behind the other in the direction of advance of the second conveyor means.

3,656,607
CONVEYOR SYSTEM FOR VISCOUS OR CEMENTITIOUS MATERIAL

Donald J. Gorgei, Boardman, Ohio; Daniel I. Weisz, Ellwood City, and Russell B. Cooper, New Castle, both of Pa., assignors to Beaver-Advance Corporation, Ellwood City, Pa.

Filed Sept. 16, 1969, Ser. No. 858,384
Int. Cl. B65g *21/00*
U.S. Cl. 198—118 **7 Claims**

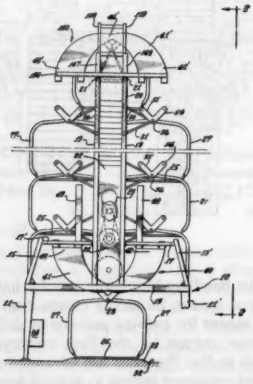


An adaptable, flexible conveyor system is provided which employs material carrying continuous belt pick-up, conveyor-transfer and turret sections. The conveyor sections are at their adjacent ends positioned in a forwardly and backwardly movably supported and horizontally-pivoted relation with respect to each other and with respect to a pick-up and to a turret section from whose continuous conveyor, cementitious, grout or somewhat viscous material is delivered to a work area. The turret section and the head end of a transfer section with which it cooperates to receive material therefrom are both mounted for forward and backward movement on a longitudinally-extending elevated track. A transfer assembly is pivotally-carried between the forward end of one conveyor section and the tail end of a cooperating conveyor section to which the material is to be delivered, and a scraper assembly is carried by the forward end of the one conveyor section within the transfer assembly for removing adhering material from the belt adjacent a head pulley. A combination scraper means is provided for cleaning an underside of a belt and the exposed side of a drive pulley at the tail end of each conveyor section which has its own individual drive unit that is mounted to facilitate adjustment of belt tension and replacement of the belt.

3,656,608
GUIDE MECHANISM FOR VERTICAL STORAGE DEVICE

Robert D. Lichti, P.O. Box 2788, Santa Fe Springs, Calif.

Filed June 19, 1970, Ser. No. 47,764
Int. Cl. B65g *15/00*
U.S. Cl. 198—138 **11 Claims**



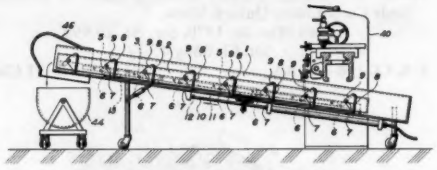
A vertical storage device has a number of storage platforms carried by a pair of endless chains which move the platforms from a lowermost loading and unloading station to various storage positions on one side or the other of the device. On each end of each platform is a v-shaped yoke with a traveler at the free end of each leg of the yoke. A pair of semi-circular tracks carried by a track guide serve the bottom and top of the device, at each end, one track being receptive of one of the travelers and the other track being receptive of the other traveler. The tracks cross each other midway between opposite ends forming an open intersection so that a traveler which is on the inside of path crosses over upon a reversal of direction and becomes the outside traveler. A pair of interconnected switch tongues at the intersection is moved to one position or another when pressed against by the first traveler to reach the intersection making certain that each traveler travels in the right track.

The tracks at each location are mounted on a guide and the guide has a limited floating attachment to the frame, held in a normal position by springs, in order to relieve the strain during operation and to minimize wear.

3,656,609
RECIPROCATING CONVEYING APPARATUS

Hideo Okano, 12-10 Sanuke, 2-Chome, Kamakura-shi, Kanagawa-ken, and Zenjiro Suzuki, 10-8 Sodegahama, Hiratsuka-shi, Kanagawa-ken, both of Japan

Filed Apr. 20, 1970, Ser. No. 30,166
Claims priority, application Japan, Apr. 24, 1969, 44/31394
Int. Cl. B65g *25/08*
U.S. Cl. 198—224 **6 Claims**



The conveying apparatus has a plurality of reciprocating, rotatable scraper elements for successively pushing particles on a stationary support frame. Forward movement of a reciprocating driving element rotates the plurality of scraper elements into an operating position and carries them in a forward direction along the conveyor. Change of direction in the movement of the driving element rotates the scraper elements into a non-operative position and further rearward movement of the driving element carries the plurality of scraper elements to their original position whereupon the aforementioned cycle is repeated to move the particles along the conveyor.

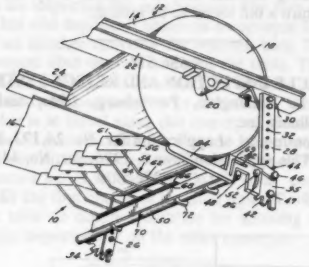
3,656,610
RESILIENTLY MOUNTED CONVEYOR BELT CLEANER

Michael R. McWilliams, Aurora, Ill., assignor to Material Control, Inc., Aurora, Ill.

Filed July 15, 1970, Ser. No. 55,174
Int. Cl. B65g *45/00*
U.S. Cl. 198—230 **4 Claims**

A resiliently mounted conveyor belt cleaner is provided to serve as a mechanical cleaner for an endless conveyor belt. The conveyor belt cleaner includes a plurality of independently operable spring-wiper blade assemblies for removing from the conveyor belt various types of abrasive and other objectionable foreign material. The spring-wiper blade as-

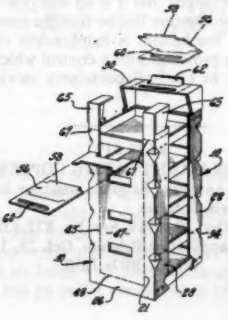
semblies each include a spring arm which is mounted by means of a resilient mounting structure which absorbs vibrations and shock and thereby minimizes fatigue of the spring arms to result in reduced breakage of the arms during use.



3,656,611
SHIPPING AND DISPLAY PACKAGE OF NURSERY FLATS

Richard S. Mertz, Torrance, Calif., assignor to American Plant Growers, Inc., Wilmington, Del.

Filed Jan. 21, 1970, Ser. No. 4,637
Int. Cl. B65d 5/50
U.S. Cl. 206—44 R 6 Claims

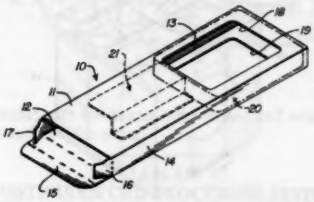


A shipping package of nursery flats comprising two panels folded into carton form and joined is convertible into a display assembly by selectively removing either of two panel sections to expose for display a series of flats contained in the package. A separable price board display forms a part of the removed panel section and is integrated with the other panel in erecting the display.

3,656,612
CARTON

Thomas J. Sellors, Waukegan, Ill., assignor to The Finn Industries Division, Potlatch Forests, Inc., Chicago, Ill.

Filed Apr. 9, 1970, Ser. No. 26,916
Int. Cl. B65d 5/50
U.S. Cl. 206—45.14 3 Claims

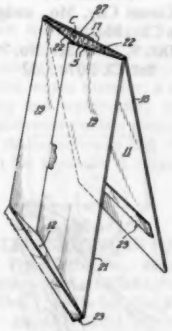


A pilferproof carton which is particularly suitable for packaging Cassette tape cartridges.

3,656,613
FOLDER FOR STRANDED MATERIALS

Armand D. LaFrance, Concord, and David F. O'Brien, Maynard, both of Mass., assignors to Container Corporation of America, Chicago, Ill.

Filed Mar. 9, 1970, Ser. No. 17,415
Int. Cl. B65d 5/52
U.S. Cl. 206—45.21 2 Claims

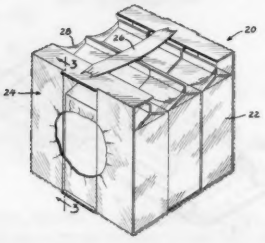


A folder for stranded material, such as Christmas tree tinsel or colored plastic strands. The folder has a pair of main panels foldably connected in end to end relationship, and side panels connected to each main panel are folded to overlapping position to hold the strands in position. The strands extend longitudinally of both main panels and across the fold line connecting the same. One of the pairs of side panels is relieved at its ends adjacent the fold line, so as to provide sharp folds in the strands at such fold line, without bunching, and so as to enable it to be displayed at such fold line for removal individually if desired. A flap foldably connected to one of the main panels is secured to the other main panel, and has a tear strip therein for readily opening the folder. A viewing window may be provided in one of the main panels so that the contents of the closed folder may be viewed without opening.

3,656,614
PACKAGE AND BLANK THEREFOR

William P. Jacobson, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed May 4, 1970, Ser. No. 34,386
Int. Cl. B65d 71/00
U.S. Cl. 206—65 S 19 Claims

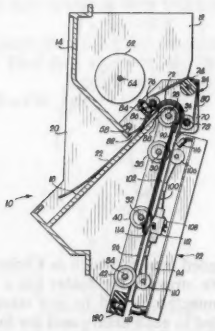


The package includes a plurality of cartons, a container formed from a blank, and a shrink film member shrunk around the container to hold the container and cartons together. The container is formed from a rectangular piece of corrugated paperboard and has a bottom wall, opposed side walls with support flaps cut from the side walls, and top wall portions overlying the support flaps and spaced from each other. A tie interconnects the top wall portions to at least temporarily hold the top wall portions in position. Thus the container has open ends and a partial top wall. The shrink film overwrap is so arranged to retain the cartons at the open ends and top of the package.

3,656,615
RECEIVING AND TRANSPORTING APPARATUS FOR CURRENCY

James F. Ptacek, Kansas City, Mo., assignor to The Vendo Company, Kansas City, Mo.

Filed Oct. 9, 1970, Ser. No. 79,456
Int. Cl. B07c 3/02
U.S. Cl. 209—73 18 Claims

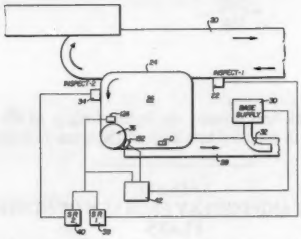


A bill transport of a currency acceptor conveys a bill inserted thereinto along a path of travel having a sharp initial bend followed by a rectilinear stretch defined by an elongated, narrow channel. The bend is formed by rollers at the inside of the bend opposed by endless belts presenting the outside of the bend. A validity test station is located intermediate the ends of the cannel, and the bill is held flat as it is advanced along the channel by two rows of opposed pairs of rollers projecting into the channel and receiving the bill adjacent its longitudinal edges. A constant speed transport drive is provided by a direct current motor governed by a centrifugal chopper. Failure to maintain proper operating speed due to jamming or the like results in the application of an unchopped voltage to the motor, causing voltage to build up across a capacitor to a level which fires a programmable unijunction transistor that, through associated switching circuits, reverses the polarity at the motor input connections to reverse the drive and return the bill to the insert opening. Such switching circuits are also operated by the validity tester to return a bill found to be invalid.

3,656,616
ARTICLE INSPECTION AND REJECT SYSTEM

Frederick L. Wallington, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.

Continuation-in-part of application Ser. No. 24,173, Mar. 31, 1970. This application June 8, 1970, Ser. No. 44,313
Int. Cl. B07c 5/00
U.S. Cl. 209—74 24 Claims

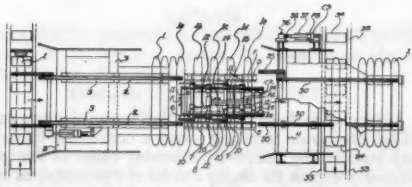


A system for inspecting articles on a continuously moving production line and ejecting flawed articles from the production line. One or more inspection stations are located at selected points along the production line to inspect articles passing through the inspection stations for specific types of flaws. Upon the detection of a flawed article, a reject signal is generated and stored in a shift register which transmits the reject signal to a reject mechanism in synchronism with the movement of the flawed container along the production line to cause the reject mechanism to eject the flawed container when the container reaches the reject station. The reject mechanism is so arranged that it is set and reset while out of registry with the production line so that the time required to set and reset the mechanism is independent of line speed. The system is also provided with a control which can set the reject mechanism to eject all containers moving along the line.

3,656,617
DEVICE FOR MANIPULATING COPPER BARS

Edouard De Bie, Antwerp, Belgium, assignor to Metallurgie Hoboken, Brussels, Belgium

Filed Oct. 20, 1969, Ser. No. 872,438
Claims priority, application Belgium, Oct. 28, 1968, 65303
Int. Cl. B07c 7/00
U.S. Cl. 209—122 10 Claims



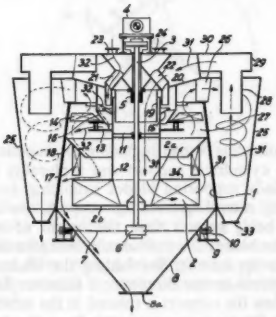
An apparatus for manipulating bars so that each face of the bar may be inspected for faults. The apparatus has a con-

veyor to feed a bar to an inspection table which houses angle iron members at each inspection station along the table. The angle irons engage a bar, lift it from the table, rotate it to expose its next face to inspection, and deposit it at the next inspection station. A tray is located at the end of the inspection table for unloading an inspected bar. The last angle iron deposits an inspected bar on the tray. The tray lifts the inspected bar and deposits it either on a conveyor for accepted bars, or on another conveyor for rejected bars. The unloading conveyors abut the outlet end of the table. The end segment of one conveyor is mounted to move in upward and downward directions relative to the table. When the inspected bar is to travel along this conveyor, the segment is in its downward position abutting the end of the table, and the tray will deposit the inspected bar on this conveyor. When the inspected bar is to travel along the other conveyor, the segment of the first conveyor is raised upward out of contact with the table to supply clearance for allowing the tray to deposit the inspected bar on the other conveyor.

3,656,618
AIR SIFTER

Hans Jurgen Janich, Alter-Hammweg, Germany, assignor to Polysius AG, Neubeckum, Graf-Galen-Str., Germany

Filed Apr. 16, 1969, Ser. No. 816,558
Claims priority, application Germany, June 19, 1968, P 17 57 819.7
Int. Cl. B07b *7/10*
U.S. Cl. 209—139 A **14 Claims**



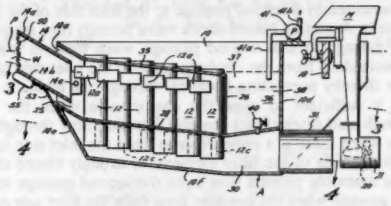
An air sifter is arranged in a sifter housing, and a fan for supplying air to the air sifter is disposed in the bottom of the sifter housing. A plurality of dust separators are arranged in crown fashion around the sifter housing. Each duct separator has an inlet connected to the upper portion of the sifter housing to receive air laden with fines discharged from the sifter housing, and has an outlet connected to supply clean air to the fan.

3,656,619
APPARATUS AND METHOD FOR REMOVING FLOATING POLLUTANTS FROM A BODY OF WATER

Donald J. Ryan, 1826 N. 24th Street; Winston P. Ledet, 1812 N. 24th Street, and James R. Colvin, 1818 N. 24th Street, all of Orange, Tex.

Filed Aug. 3, 1970, Ser. No. 60,287
Int. Cl. E02b *15/04*
U.S. Cl. 210—83 **11 Claims**

Apparatus and method for removing floating pollutants such as crude oil from a body of water, wherein separator means is towed, propelled or is otherwise moved through the body of water for directing the floating pollutants with a minimum of the water through the separating means, whereby the pollutants may be rapidly removed from the

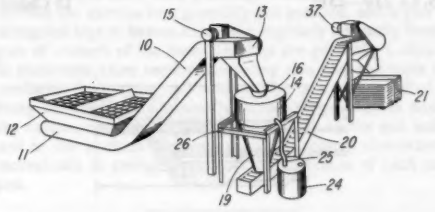


body of water with substantially no mixing and emulsifying of the pollutant with the water.

3,656,620
CONTINUOUS CHIP PROCESSING SYSTEM

Charles R. Larson, Bellevue, and Robert H. Dudley, Kalamazoo, both of Mich., assignors to Prab Conveyors, Inc., Kalamazoo, Mich.

Filed Feb. 26, 1970, Ser. No. 14,312
Int. Cl. B04b *13/00*
U.S. Cl. 210—110 **11 Claims**

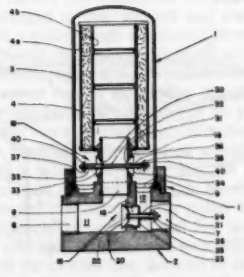


Continuous system for separating a liquid from a liquid-solid admixture comprises a feed conveyor means for transporting the admixture, an electrically-driven centrifugal separator and control means therefor, a discharge conveyor means for receiving and transporting away the separated solids, and a feed conveyor control means responsive to the rotational speed of the separator so that the feed conveyor is operable only when the separator is operating at a predetermined speed.

3,656,621
SINGLE LINE RETURN FILTER

Henry P. Barthe, Pittsburgh, Pa., assignor to Schroeder Brothers Corporation, McKees Rocks, Pa.

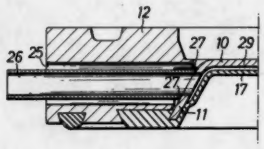
Filed Oct. 1, 1970, Ser. No. 77,202
Int. Cl. B01d *27/10*
U.S. Cl. 210—133 **2 Claims**



A single line return filter for insertion in a bidirectional conduit comprising a housing having a filter element

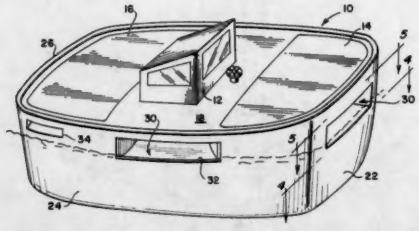
disposed therein. The housing has a reservoir-side port which is connected by a first passage to the discharge side of the filter element. The housing also has a pump-side port which is connected by a second passage to the inlet side of the filter element. A weakly biased check valve permits flow from said first passage to said second passage when there is a slight pressure drop from the discharge side to the inlet side of the filter thereby preventing backflow through the element. The bias is sufficient to close the check valve when the flow through said filter ceases thereby directing flow through the filter when there is a pressure drop from the inlet side to the discharge side of the filter element. A strongly biased check valve assembly permits flow from the second passage to the first passage when the pressure drop from the inlet side of the filter element to the discharge side exceeds a preset safe level.

3,656,622
FILTER PLATE ELEMENT
Franz Heimbach, and Alfons Schotten, both of Dueren, Germany, assignors to Eberhard Hoesch & Sohne, Duren, Germany
Filed July 6, 1970, Ser. No. 52,193
Claims priority, application Germany, Dec. 4, 1969, P 19 60 821.0
Int. Cl. B01d *25/12*
U.S. Cl. 210—231 **15 Claims**



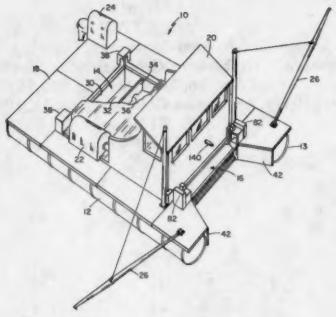
A filter plate element for use in filter presses has a peripheral frame surrounding an inner free space and having an inwardly directed surface which bounds this space and a pair of axial endfaces. A press diaphragm includes a main portion accommodated in the free space intermediate the endfaces and a circumferential edge portion which bounds the main portion and which overlies a circumferential portion of the surface, extends to one of the endfaces where it is secured by means of a marginal circumferential bead received in a groove provided in this one endface.

3,656,623
LIQUID SEPARATION APPARATUS
Harold G. Quase, Potomac, Md., assignor to Underwater Storage, Inc., Washington, D.C.
Filed Oct. 16, 1969, Ser. No. 866,931
Int. Cl. B01d *17/02*; **E02b** *15/04*
U.S. Cl. 210—242 **4 Claims**



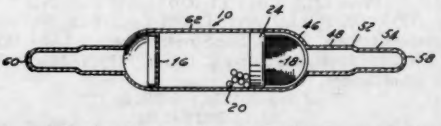
A partially submergible platform has internal separation tanks, which are provided with screens for removing solid materials from water. Skimmers remove a relatively light immiscible liquid before returning the water to the body from which it is taken. In one form of the invention, contaminated water is pumped upward into separation tanks, and gravity drains the separated water from the tank and vessel. In another embodiment, contaminated water flows into separation tanks, and purified water is pumped from the tanks, preferably rearwardly, for propelling the craft through the water. Gates form lower edges of intakes, so that the amount of water taken into the boat and the depth of the intake may be controlled.

3,656,624
APPARATUS FOR COLLECTING WASTE FROM THE SURFACE OF A BODY OF WATER
James F. Walton, 129 Front Street, Marblehead, Mass.
Filed Dec. 12, 1969, Ser. No. 884,510
Int. Cl. E02b *15/04*
U.S. Cl. 210—242 **21 Claims**



A waste collecting vessel including an impeller assembly comprising a cylindrical support and a plurality of flexible, circumferentially supported blades extending longitudinally of and radially extending from the support, the diameter of the support being greater than the height of each blade. Preferably, the blades are individually mounted and the vessel includes a lip member for folding the blades when the support is rotated in one direction, a skimmer for engaging the blades when the support is rotated in the other direction, and a system for removing materials from the bottom of a deep well of a waste collection tank and for transporting waste from within the tank to storage tanks within support pontoons.

3,656,625
DRIER
Edward W. Bottum, 9357 Spencer, Brighton, Mich.
Filed Feb. 17, 1971, Ser. No. 116,095
Int. Cl. B01d *27/02*, *27/08*
U.S. Cl. 210—266 **5 Claims**



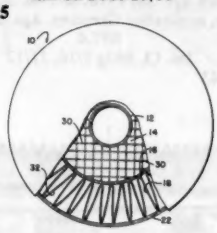
A method of making a drier construction for connection into a refrigeration system is disclosed. The drier construction includes a one-piece body comprising a central cylindrical tubular portion defining a chamber enclosing a desiccant charge with suitable screen and baffle elements. Each end of

the body is spun down from the main body by a mechanical spinning process to form stepped tubular extensions. The end of each extension is spun down to form a substantially fluid-tight end closure.

3,656,626
FILTERING MATERIAL
Nicholas Sama, 4940 Southwest 95th Avenue, Miami, Fla.
Filed Sept. 14, 1970, Ser. No. 72,128
Int. Cl. B01d 23/10
U.S. Cl. 210—282 2 Claims

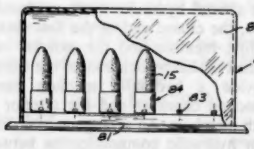
A filtering device for use in spanning relation of the filter flow path of a liquid which includes a container having an upstream and a downstream screen means, and a bed of shredded pieces of open-celled material, such as polyurethane foam, captivated in the container so that the liquid to be filtered is constrained to flow through the bed.

3,656,627
COMPOSITE FILTER ASSEMBLY
Southwick W. Briggs, Chevy Chase, Md., assignor to William Brazerol, Washington, D.C., a part interest
Continuation of application Ser. No. 780,303, Oct. 14, 1968, now abandoned , Continuation-in-part of application Ser. No. 653,712, June 17, 1967, now abandoned. This application May 27, 1970, Ser. No. 41,718. The portion of the term of this patent subsequent to Feb. 16, 1988, has been disclaimed.
Int. Cl. B01d 25/18
U.S. Cl. 210—315 10 Claims



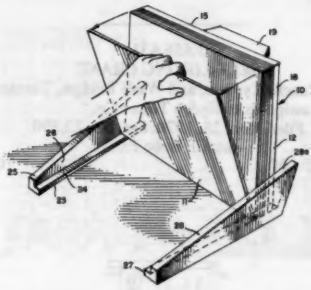
A radial flow filter having fixed end caps, a first filter comprising a stack of annular disks having their outer edges secured in fixed position are disposed between the end caps, and a second filter composed of pleated paper is disposed concentrically around the disks, or alternatively is disposed within the disks.

3,656,628
MANIFOLD LIPSTICK HOLDER
Murray Dulberg, New York, N.Y.
Original application Aug. 6, 1968, Ser. No. 750,695, which is a continuation-in-part of application Ser. No. 599,461, Dec. 6, 1966, now abandoned. Divided and this application May 15, 1970, Ser. No. 37,586
Int. Cl. A47f 7/00
U.S. Cl. 211—13 1 Claim



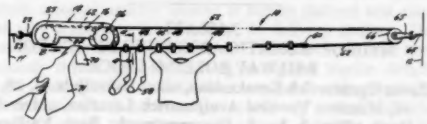
A holder for multiple lipstick refills individually exchangeable with a lipstick similarly retained in a refillable retractable lipstick holder.

3,656,629
STORAGE RACK
William M. Irion, III, 5605 Lakeside, Lisle, Ill.
Filed Aug. 31, 1970, Ser. No. 68,143
Int. Cl. A47g 29/00
U.S. Cl. 211—40 4 Claims



A rack for supporting and storing generally rectangular objects such as record jackets, boxes for audio tapes, and the like. The rack includes a generally rectangular base for supporting the cartons in a generally flat position, and a pair of elongated legs or braces extending angularly upwardly from a pair of corners of the base. The legs are generally L-shaped in transverse cross section, providing side and end walls for confining the cartons on the base. The rack may be tilted to bring the legs into a generally horizontal position in which the cartons are supported on end primarily by the end walls, and in this position the cartons can be rotated downwardly individually to permit inspection and selection of each carton.

3,656,630
CLOTHES LINE AND CLOTHES PIN ASSEMBLY
Robert Miguel, 364 60th Street, Brooklyn, N.Y.
Filed Jan. 2, 1970, Ser. No. 195
Int. Cl. D06f 53/00
U.S. Cl. 211—119.11 4 Claims



A combined clothes line and clothes pin assembly embodying an endless clothes line suspended from two pulleys, one pulley being secured to one support and the other pulley being carried in a pulley block suspended from another support opposite to said one support. Mounted within the pulley block is a combined pulley and reel unit rotatable on a common axis, the upper run of the clothes line being wrapped around counter-clockwise on the pulley of the pulley and reel unit and the lower run extending freely from the pulley in the pulley block to the other pulley secured to said one support. Within the pulley block, the pulley and the pulley of the combined pulley and reel unit rotate on parallel axis transverse to the longitudinal extent of the pulley block. Wound counter-clockwise on the reel is a reel line having one end secured to the reel and the other end to a selected point on the lower run of the clothes line. Secured to the reel line in selected spaced relation are clothes pins or clips each having opposed resilient arms for gripping an article of apparel, etc. The reel line with its clips is unwound as the clothes line is

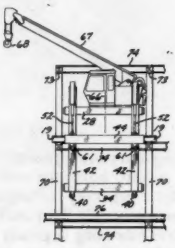
moved in a direction towards the pulley carrying one end of the same remote from the pulley block, the articles of apparel being hung on the clothes line in a zone beneath the pulley block such that the unwinding reel line will successively present clothes clips that will grip desired parts of the articles of apparel, etc. to be carried by the lower run of the clothes line.

3,656,631

SELF-LIFTING CRANE

Gerald B. Rauch, Cypress, and Wade Bridges, Torrance, both of Calif., assignors to Hydro Tower Co.

Filed Mar. 25, 1970, Ser. No. 22,590
Int. Cl. B66c *23/06*
U.S. Cl. 212—57 **10 Claims**



A self-lifting crane adapted to raise or lower itself to different levels of any building or horizontal structural members of the building said crane including a frame having four lower outriggers and four upper outriggers which can be retracted and extended by hydraulic cylinders to selectively support the crane on horizontal structural members of a building and four lift outriggers which can be retracted and extended by hydraulic cylinders to selectively support the crane on horizontal structural members of a building; said lift outriggers being mounted in a support structure which can be moved up or down by hydraulic jacks to raise or lower the crane through the use of four positive displacement pumps; said crane including in its hydraulic system trim valving to supply to any one or more of said hydraulic jacks additional fluid to maintain the level of the crane.

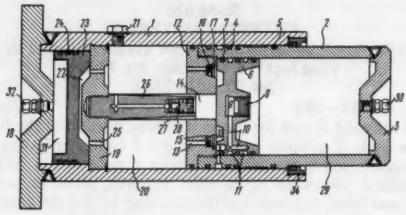
3,656,632

HYDROPNEUMATIC ABSORBING DEVICE FOR RAILWAY ROLLING STOCK

Zaven Oganezovich Karakashian, ulitsa Dobroljubova, 18, kv. 46, Moscow; Vsevolod Arutjunovich Lazarian, universitetskaya ulitsa, 3, kv. 9, Dnepropetrovsk; Boris Vasilievich Azarov, ultisa Schorsa, 13, kv. 1, Kaliningrad; Mikhail Mikhailovich Bolotin, Pogonny proezd, 7, kv.2, Moscow; Vladimir Yakovlevich Pershin, 1 Paveletsky proezd, 1/42, korpus 1, kv. 11, Moscow; Albert Isidorovich Timoshuk, B. Pirogovskaya ulitsa, 53/55, kv. 114, Moscow; Anatoly Alexandrovich Dragonenko, B. Cherkizovskaya ulitsa, 10, korpus 3, kv. 51, Moscow; Ilia Yakovlevich Zarakhovich, oblastnoi, ulitsa Neftyanaya, 13, and Mikhail Vasilievich Svidirov, oblanstnoi, 2-oi Oktyabrsky pereulok, 10, kv. 6, both of Kaliningrad, all of U.S.S.R.

Filed Apr. 13, 1970, Ser. No. 27,796
Int. Cl. B61g *9/16, 11/12*
U.S. Cl. 213—43 **3 Claims**

A hydropneumatic absorbing device used in a railway rolling stock, comprising a cylinder having a movable cylinder mounted at the open end thereof and accommodating a floating piston and connected with a piston provided with through openings. Secured near the bottom of the cylinder is a partition forming together with the piston a space to be filled with working liquid, and together with the bottom of the cylinder — an additional chamber accommodating an additional piston. The partition is provided with through openings through which the working liquid is supplied into the additional chamber and displaces the additional piston. The spaces adjacent to the bottoms of the two cylinders are filled with compressed gas and the pressure in one of the spaces is several times greater than the pressure in the other space.

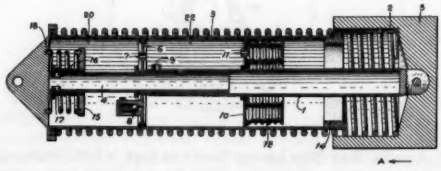


3,656,633

SHOCK ABSORBER

Fritz Ostwald, Buchschlag, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 20, 1970, Ser. No. 30,055
Claims priority, application Germany, Apr. 29, 1969, P 19 21 897.4
Int. Cl. B61g *9/16, 11/12*
U.S. Cl. 213—43 **11 Claims**



A hydraulic shock absorber for railroad cars having a first cylindrical member having a closed end and an opened end; a second cylindrical movable member disposed adjacent the opened end of the first member, surrounding the first member, longitudinally movable with respect to the first member and connected to a movable load; a third tubular member disposed within and coaxial of the first member and secured to the second member and a fourth tubular member secured to the closed end of the first member and disposed within and coaxial of the first member extending into and in a slidable non-sealed association with the third member. First and second piston discs are disposed transverse of the first member in a predetermined manner to form a first hydraulic medium chamber between the first and second discs, the interior of the first member and the exterior of the third member and a second hydraulic medium chamber between the second disc, the closed end of the first member, the interior of the first member and the exterior of the fourth member. The non-sealed association of the third and fourth members provide a hydraulic medium communication between the second chamber and the interior of both the third and fourth members. An arrangement is disposed in the second disc for hydraulic communication between the first and second chambers. At least one passageway is provided extending transversely from the interior of the fourth member to the second chamber. A control sleeve carrying thereon an inert mass slidably engages the fourth member adjacent the closed end of the first member and the one

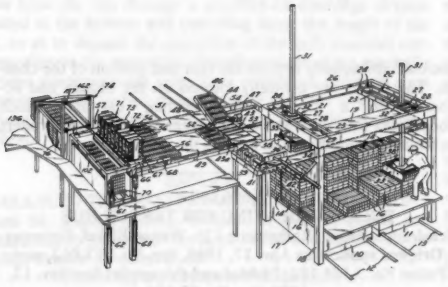
passageway and is responsive to deceleration of the load. This latter arrangement closes the one passageway when the deceleration is less than the given amount and opens the one passageway when the deceleration is greater than the given amount to reduce the damping of the shock absorber.

3,656,634

BRICK HANDLING AND STACKING MACHINE

Frank S. Pearne, San Gabriel, and Florentin J. Pearne, Whittier, both of Calif., assignors to Aircraft Mechanics, Inc., Los Angeles, Calif.

Filed Dec. 4, 1970, Ser. No. 95,157
Int. Cl. B65g 57/26
U.S. Cl. 214—6 A 16 Claims



A machine for handling bricks or the like is disclosed. The machine functions to grip grids including a plurality of spaced and parallel double lines of brick located within stacks on a kiln car and to position such grids on first conveyor means. These conveyor means deliver the grids to a spreader which spreads the grids into double rows with one brick resting upon another. An inverter transfer grips the upper rows and transfers them in their spread condition to a laterally spaced location. The separated or spread rows are then delivered by second conveyor means to a stacker which operates to simultaneously form a stack on a stacking elevator corresponding to each row. The stacks are then moved out of the stacker for subsequent processing leaving the stacker free for subsequent stacking. Each subassembly simultaneously handles a number of brick substantially equal to the number of brick in a grid thereby providing high machine outputs with relatively slow subassembly cyclic rates.

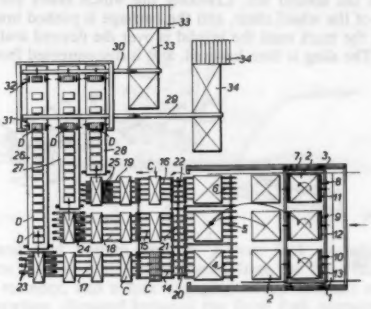
3,656,635

UNSTACKING AND SORTING OF BRICKS

Karl Schafer, and Dieter Keck, both of Laggenback/Westphalia, Germany, assignors to C. Keller U. Co., Laggenback/Westphalia, Germany

Filed Nov. 17, 1970, Ser. No. 90,336
Claims priority, application Germany, June 29, 1970, P 20 31 996.4
Int. Cl. B65g 59/02
U.S. Cl. 214—8.5 C 8 Claims

Apparatus for unstacking and sorting bricks which have been fired to various tones comprises grippers which remove layers of bricks from a number of stacks and deposit the bricks on first conveyors. The first conveyors feed the bricks to devices which align transverse rows of bricks and turn the bricks over. The bricks are then fed by second conveyors and thence by third conveyors extending transversely to the second conveyor. Group of bricks are lifted from the third conveyors and are deposited on a selected fourth conveyor



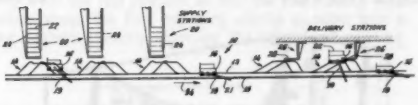
which feeds the groups of bricks to a respective packing station.

3,656,636

SYSTEM AND APPARATUS FOR AUTOMATICALLY COLLECTING, SORTING AND DISTRIBUTING ARTICLES FROM ONE OR MORE LOCATIONS TO ONE OR MORE LOCATIONS

William N. Konstantin, Norwalk, Conn., assignor to Product Design Corporation, Norwalk, Conn.

Filed Nov. 24, 1969, Ser. No. 870,564
Int. Cl. B65g 59/06
U.S. Cl. 214—8.5 F 16 Claims



System and apparatus for automatically collecting, sorting and distributing articles from one or more locations to one or more locations are described wherein a conveyor system gathers selected articles located at supply stations and automatically transports these articles to delivery stations. The conveyor system incorporates main and side tracks with continuously driven carriers moving along the tracks. Article supply and delivery stations are associated with respective side tracks and the carriers are selectively routed onto the side tracks with system-controlled track switches, the data for controlling the switches is advantageously shown as being transmitted by the respective carriers themselves. A drive mechanism in the form of a continuous chain is coupled to the carriers by means of a drive link which is pivotably coupled from the drive chain to the carriers with the orientation of the link relative to the drive chain being controlled for speed control of the carriers at the respective article handling stations. Meshing engagement of article carriers with the article supply and delivery stations assures a rapid article handling system. Various system configurations are disclosed.

3,656,637

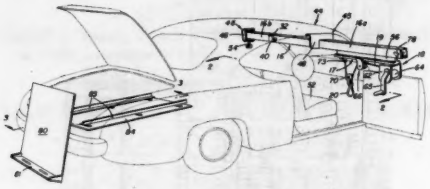
INVALID CAR LIFT

Ray E. Lynn, 5172 Acacia, San Bernardino, Calif., and Dwane P. Simmons, 7465 Olive Tree Lane, Highland, Calif.

Filed June 30, 1970, Ser. No. 51,115
Int. Cl. B60p 1/02
U.S. Cl. 214—75 H 4 Claims

Apparatus to enable wheel-chair invalids to be transferred into and out of an automobile, comprising an overhead track

reaching all the way through the open door and opposite window to hook onto the rain gutter on both sides, and a wheeled carriage that rides on the track. The carriage has a winch and wire rope tackle that hooks onto a canvas sling in which the invalid sits. Cranking the winch raises the sling clear of the wheel chair, and the carriage is pushed inwardly along the track until the invalid is over the desired seat location. The sling is then lowered, and is disconnected from the



tackle. The track is removed and divides into sections that fit into the car trunk. The folded-up wheel chair is placed on a pallet having wheels at its front end which run on tracks in the trunk. Hooks on the underside of the pallet engage limit stops mounted on the rear bumper, to limit rearward movement of the pallet, and these cooperate with pallet-supporting wheels on the bumper to serve as pivots to lower the rear end of the pallet to the ground.

3,656,638

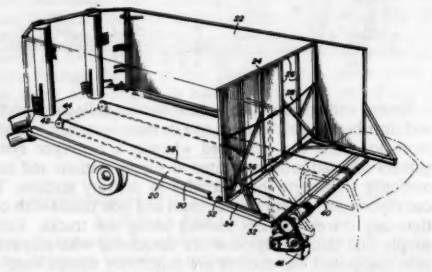
HAY DISTRIBUTOR

Duane A. Hutton, and Wallace Hutton, both of Baker, Oreg., assignors to John L. Jacobson, Baker, Oreg., a part interest

Filed Mar. 26, 1970, Ser. No. 22,849

Int. Cl. E01c *19/20*

U.S. Cl. 214—83.14 **12 Claims**



A machine for feeding loose hay to livestock in parallel rows. The machine includes a mobile truck bed having a powered rearwardly moving push gate and a pair of hay distributing cylinders mounted on the rear of the bed for engaging and outwardly feeding the hay. The cylinders mount feeding fingers which grip and move the hay. Strippers are provided for cleaning the feeding fingers and spring-loaded holding fingers are utilized laterally of each cylinder so as to assist in an even distribution of the hay.

3,656,639

BOAT TRAILER WITH LAUNCHING AND LOADING DEVICE

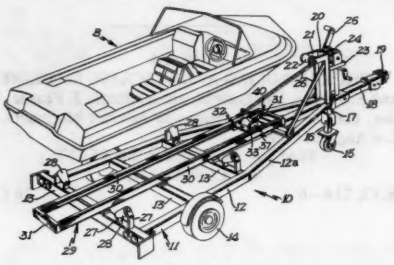
Julius Lothen, 1600 Elliot Avenue South, Minneapolis, Minn.

Filed May 14, 1970, Ser. No. 37,153

Int. Cl. B60p *3/10*

U.S. Cl. 214—84 **5 Claims**

A conventional boat trailer comprising a chassis, ground engaging wheels, winch, and stationary revolvable tapered support rollers is provided with a boat launching and loading device. The boat launching and loading device includes a pair of narrow parallel elongate tracks affixed to the chassis of the trailer and extending from the front end portion



thereof substantially beyond the rear end portion of the chassis. The tracks are centrally located on the chassis and accommodate a small bow-supporting carriage which cooperates with the width and conventional stationary rollers to facilitate launching and loading the boat.

3,656,640

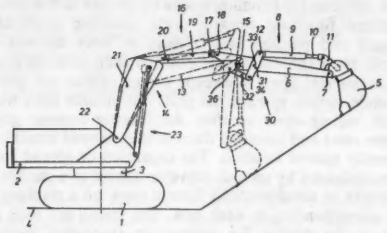
BUCKET MOUNTING FOR TRENCH HOE

Friedrich Schwing, Rathausstr. 126, Wanne-Eickel, Germany

Original application Apr. 17, 1969, Ser. No. 817,062, now Patent No. 3,586,182. Divided and this application Nov. 12, 1970, Ser. No. 88,664

Int. Cl. E02f *3/32*

U.S. Cl. 214—138 R **3 Claims**



A trench hoe which, when in operation, maintains the digging bucket at a given digging angle. The digging bucket is constructed as a ditcher and the dimension of the trapezoid control system consisting of the bucket, the dipper arm, the front thrust piston drive, and the link means between the front thrust piston drive and the dipper arm, in relation to the dimensions of the outrigger arm is such that the dipper arm in operation at the desired angle of slope or gradient is guided approximately parallel within a predetermined range of angles of slope or gradients.

3,656,641

METHOD FOR UNIFORMLY DISTRIBUTING BULK MATERIAL TAKEN FROM A STOCKPILE

Lambert Smits, Langenberg, Germany, assignor to Westfalia Dinnendahl Groppel Aktiengesellschaft, Bochum, Germany

Filed Oct. 28, 1970, Ser. No. 84,567

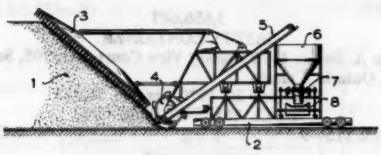
Claims priority, application Germany, Oct. 28, 1969, P 19 54 105.0

Int. Cl. B65g *65/28*

U.S. Cl. 214—152 **2 Claims**

Method of uniformly distributing bulk material reclaimed from an elongated stockpile includes clearing bulk material

from a section of the stockpile and raising the bulk material with a single clearing device capable of traveling transversely to the stockpile and mounted on a bridge movable in longitudinal direction of the stockpile, delivering the material raised by the clearing device to a bin extending substantially over the width of the stockpile and depositing in the bin, respectively, the material corresponding to the cleared section of the stockpile, and discharging the material at adjusted flow



rates from the bin through a plurality of discharge devices located at the bottom and extending along the length of the bin, so as to deposit the quantities of the bulk material corresponding to the respective cleared sections of the stockpile at rates commensurate with their respective volumes on a common discharge belt underlying the plurality of discharge devices; and apparatus for carrying out the foregoing method.

3,656,642

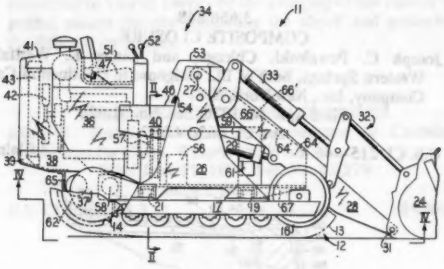
BALANCED TRACK-TYPE LOADER CONSTRUCTION

James M. Kostas, Peoria; William B. Norick, Joliet, and Raymond R. Laughlin, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 14, 1969, Ser. No. 850,171

Int. Cl. E02f 3/76

U.S. Cl. 214—140 **6 Claims**



A rigid frame riding on tracks carries forwardly directly lift arms pivoted to towers at the central portion of the vehicle. The engine is disposed over the rear track sprocket axis and is spaced rearwardly from the lift arms providing for an operator's compartment which is between the engine and the arms and which overlaps the front of the engine. Fuel and hydraulic tanks are shaped to conform with the region below the lift arms when the arms are in the lowered position. The construction provides a weight distribution facilitating load handling and provides an operator station combining good visibility, easy access and safety.

3,656,643

MATERIAL HANDLING APPARATUS

George Keneson, 7156 Broadway, Ross Township, Lake County, Ind., and Marion D. Lewis, R.R. 1, Kluver Road, New Buffalo Township, Berrien County, Mich.

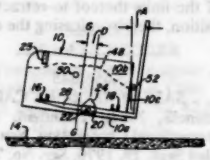
Filed Aug. 11, 1970, Ser. No. 62,933

Int. Cl. B65d 47/00

U.S. Cl. 214—315 **25 Claims**

Material handling apparatus is disclosed for receiving, transporting and dumping a material.

The material handling apparatus has a dump type box having a bottom portion, opposed side portions and a back portion defining a load carrying cavity. The dump type box also has a front fork engaging member on one portion of a side



portion and said bottom portion, a rear fork engaging member on the one portion and spaced from the front fork engaging member, and a fork engaging stirrup member on the one portion, disposed between the front fork engaging member and the rear fork engaging member and pivotable on the one portion. A lifting fork device is reciprocable in a vertical plane with respect to the supporting surface and has a tine.

The tine is insertable through the fork engaging stirrup member while the dump type box is in the rest position and into registry with the front fork engaging member and the rear fork engaging member so that the tine engages the front fork engaging member and the rear fork engaging member when the tines moves the dump type box away from the rest position into a box transporting position to permit filling of the load carrying cavity with a material. The tine then is operable to return the filled dump type box to the rest position to permit the tine to clear the front fork engaging member, while the filled dump type box is in the rest position. The tine then is operable to move the filled dump type box away from the rest position so that the filled dump type box rotates about the fork engaging stirrup member into a dumping position thereby emptying the filled load carrying cavity.

3,656,644

AGRICULTURAL AND OTHER VEHICLES

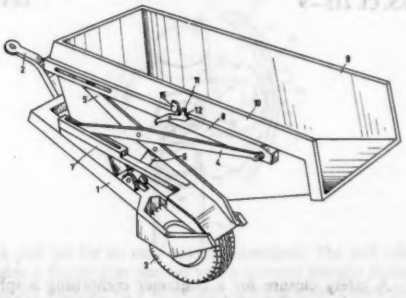
Ernst Wagenblast, Singen, and Heinz Hohlwegler, Gottmadingen, both of Germany, assignors to Maschinenfabrik Fahr Aktiengesellschaft, Gottmadingen, Germany

Filed Jan. 28, 1970, Ser. No. 6,458

Claims priority, application Germany, Feb. 5, 1969, P 19 05 665.6

Int. Cl. B60p 1/64

U.S. Cl. 214—390 **8 Claims**



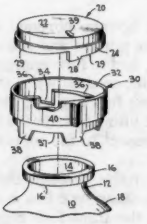
A vehicle for transporting containers has a bifurcate frame with a pair of parallel, generally horizontal bars as its prongs,

these bars being articulated to hydraulically operable scissor linkages by which they may be raised and lowered together with a container overhanging the bars by its rim. Either or each bar carries a pivoted latch to hook onto a lateral projection on the container when the beams are elevated by the extended linkages, a collapse of the linkages to lower the beams causing one of the links thereof to retract the latch into an inoperative position, thereby releasing the container.

3,656,645
SAFETY CLOSURE CAP

John L. Fontenelli, North Plainfield, N.J., assignor to Diamond International Corporation, New York, N.Y.

Filed Sept. 29, 1970, Ser. No. 76,390
Int. Cl. A61j *1/00*; **B65d** *55/02*
U.S. Cl. 215—9 **9 Claims**

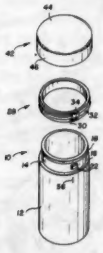


A closure cap is snap-fitted over the neck of a container. A locking member rotatable and axially movable on the neck beneath the cap has depending spring fingers which abut against the container shoulder and urge the locking member into operative engagement with the cap. Axial projections on the cap and the locking member are interlocked to prevent relative rotation of the members, and a guard ring projecting upwardly from the locking member encircles and bars access to the lower edge of the cap skirt. Manual downward displacement of the locking member against the resilient thrust of the spring fingers disengages the interlocked projections and permit relative rotation between the members so that cooperating cam surfaces on their projections may engage and force the closure cap member axially from the container neck.

3,656,646
SAFETY CLOSURE FOR A CONTAINER

Clarence R. Taylor, Penfield, N.Y.

Continuation-in-part of application Ser. No. 797,968, Feb. 10, 1969, now abandoned, which is a continuation-in-part of Ser. No. 884,204, Dec. 11, 1969. This application June 24, 1970, Ser. No. 49,268
Int. Cl. B65d *55/02*; **A61j** *1/00*
U.S. Cl. 215—9 **14 Claims**

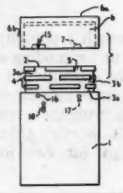


A safety closure for a container comprising a split ring mounted on a neck of the container and having at least one lock or detent between the ring and neck. When a cap is screwed on the container in a cap-tightening direction to form a container safety closure, the lock prevents rotation of the ring in only the cap-tightening direction, and when the cap is moved to a tightened position, it cannot be removed from the container upon normal movement in a cap-removing direction. To remove or unscrew the cap from the container, it is necessary in at least one embodiment to deform the ring in response to movement of the cap on the container in one direction, and then to move the cap in a different direction to unscrew it from the container.

3,656,647
SAFETY CONTAINER

Moyle A. Swinn, 1170 Ramsey View Court, Apt. 705, Sudbury, Ontario, Canada

Filed July 20, 1970, Ser. No. 56,623
Int. Cl. A61j *1/00*; **B65d** *55/02*
U.S. Cl. 215—9 **5 Claims**

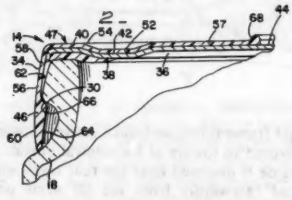


A safety bottle with a so-called "child-proof" closure that can be removed only by a series of alternating rotative and longitudinal movements similar to that employed in locks on safes or vaults, the closure being allowed to rotate freely for the full circumference but being movable longitudinally from one rotatable position to the successive one at only specific predetermined rotative locations.

3,656,648
COMPOSITE CLOSURE

Joseph C. Powaloski, Chicago, and James E. Westfall, Western Springs, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 24, 1970, Ser. No. 31,650
Int. Cl. B65d *43/02*
U.S. Cl. 215—46 R **3 Claims**

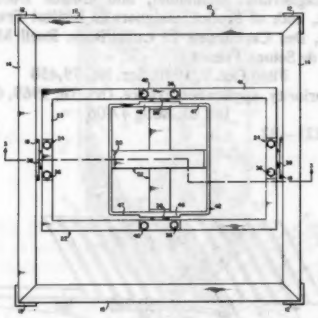


A composite closure consisting of a flexible plastic fitment and a gasketed rigid metal closure panel. The metal closure panel is retained within the fitment by a circumferential shoulder. A lifting ring in the top of the flexible plastic fitment is joined to marginal portions of the fitment panel by breakable bridging portions and by a substantially unbreakable integral hinge portion attached directly to a portion of the skirt. Once the breakable bridging portions are broken, the semidetached ring serves to alert shoppers that the closure has been previously tampered with or removed. The exterior face of the downwardly extending skirt of the plastic fitment is substantially straight, and extends to tight abutment with a shoulder on the container making it difficult to pry the fitment off the container with an ordinary knife blade.

In a preferred embodiment, the ring and peripheral portion of the flexible plastic fitment have a cooperative relationship

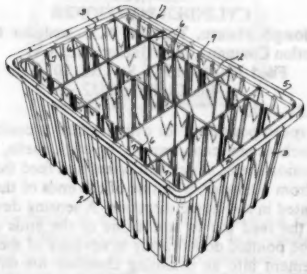
with a recess in the metal closure panel to form a stacking ring to assist in the stabilization of stacked containers.

3,656,649
DELICATE INSTRUMENT SHIPPING CRATE
Louis N. Martin, Route 1, P.O. Box 406B, Brandywine, Md.
Filed July 20, 1970, Ser. No. 56,523
Int. Cl. B65d *25/12, 85/30*
U.S. Cl. 217—52 **4 Claims**



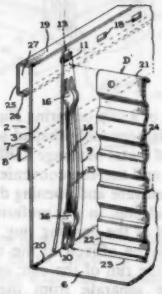
A shipping crate for delicate instruments including a wooden crate inside of which a frame is gimbal mounted. The delicate instrument is strapped to the frame with its center of gravity disposed below the frame plane The gimbal mounting of the frame maintains the instrument case in a generally vertical attitude regardless of the orientation of the crate during transit, and shocks delivered to the crate are converted to kinetic energy by the swinging of the case in the gimbal mount thereby mitigating the shock and protecting the delicate instrument.

3,656,650
COMPARTMENTALIZED CONTAINER
Allen H. Frater, Nashotah, Wis., assignor to Container Development Corp., Watertown, Wis.
Filed June 11, 1970, Ser. No. 45,279
Int. Cl. B65d *25/06*
U.S. Cl. 220—22.3 **8 Claims**



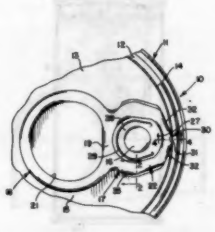
A compartmentalized container having a series of interlocking and removable partitions to divide the container into a series of compartments. The vertical side edges of each partition fit into grooves in the walls of the container and one horizontal edge of each partition is provided with a series of slots that extend approximately one-half of the height of the partition, and the portions of the partition extending from the end of each slot to the opposite horizontal edge define connecting portions. Each partition is interlocked with at least one normally arranged partition in a manner such that the connecting portions of each partition are received within the slots of the other partition. To provide increased rigidity a pair of ribs are located on each side of the slot and also border each connecting portion.

3,656,651
DRAWER DIVIDER
Carl H. Hage, Youngstown, Ohio, assignor to The General Fireproofing Company, Youngstown, Ohio
Filed June 1, 1970, Ser. No. 42,146
Int. Cl. B42f *17/12*
U.S. Cl. 220—22.3 **11 Claims**



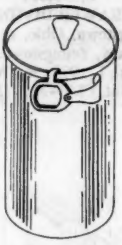
A drawer divider arrangement includes a mounting element having an arcuate body and provided with a single tab freely insertable within an opening in a drawer wall. Channel means on the mounting element permits the insertion of a divider which deflects the arcuate body to provide a biasing action.

3,656,652
PULL TAB
Nick S. Khoury, Worth, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Mar. 16, 1970, Ser. No. 19,568
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **1 Claim**



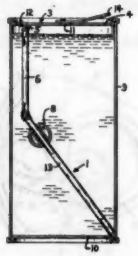
A pull tab for an easy opening container. The pull tab includes a finger grip portion and a forward portion having a nose for penetrating a score line defining a removable panel portion. The forward portion is formed with a rib including an outer peripheral depending flange. The depending flange terminates in an outwardly extending lip which serves to increase the resistance against bending.

3,656,653
RETAINER FOR CAN CLOSURE
Herbert Arthur Bly, P.O. Box 57, North Brunswick, N.J.
Filed Oct. 20, 1969, Ser. No. 867,555
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **1 Claim**



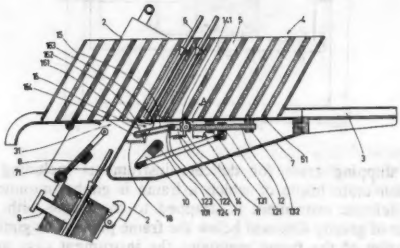
A retainer consisting of a clip or spring clip made of metal, plastic, or other material, specially shaped so that it may be readily affixed to rim of metal beverage cans for the purpose of attaching to the can and thereby conveniently disposing of the ring-and-tear-strip closure and opening device commonly used on such cans. Said clip, in the preferred embodiment, may be an integral part of the opening ring, so that the clip, ring, and tear-strip may be affixed to the can by manually pressing the clip over the rim of the can; or in an alternate configuration, may be separate from the ring and permanently attached to the rim or other part of the can, so that the opening ring and tear-strip may be affixed to the can by sliding the ring under the free end of the spring clip. As an adjunct to either form of my invention, or alone, a pouch or shield of flexible or rigid material, may be affixed to the can to cover or contain the ring-and-tear-strip.

3,656,654
CONTAINER AND DRINKING TUBE
William J. Brinkley, III, 106 East Eastport Street, Iuka, Mich.
Filed June 25, 1970, Ser. No. 49,593
Int. Cl. A47g *19/22*
U.S. Cl. 220—90.2 **8 Claims**



In combination, a beverage container and drinking tube and means to present the tube for use upon opening the container wherein a drinking tube for use with a beverage container having a tear-out strip in the lid thereof is an elongate tubular member having a length at least equal to an interior diagonal dimension of the container and an upper end portion thereof engaged by a positioning member mounted on the tear-out strip which guides the upper end portion through an opening in the lid formed by removal of the tear-out strip. A float member is mounted on the tubular member for raising the upper end thereof through the opening in the lid formed by removing the tear-out strip.

3,656,655
DEVICE FOR FEEDING AN EXPLOSION GENERATOR WITH EXPLOSIVE CHARGES
Pierre Magneville, Vernouillet, and Claude Duconge, Le Vesinet, both of France, assignors to Institut Francais Du Petrole, Des Carburants Et Lubrifiants, Ruell Malmaison (Hauts de Seine), France
Filed Oct. 9, 1970, Ser. No. 79,450
Claims priority, application France, Oct. 10, 1969, 6934910
Int. Cl. B65g *47/06*
U.S. Cl. 221—82 **7 Claims**

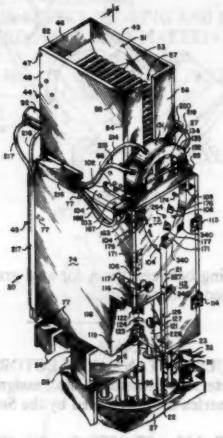


Device for feeding explosive cartridges to a charging tube of an explosion generator wherein said cartridges are stored, each in a compartment of a magazine displaceable along a slideway so that successively each compartment registers with a hole in the slideway in line with the opening of the charging tube and comprising a reciprocating shaft actuated through a crank and a connecting rod and solid with a catch adapted to come into engagement with recesses provided at the base of the magazine, a rocking lever with pawls adapted to block the magazine by engagement with a recess thereof and a connecting rod with a longitudinal slot connecting said rocking lever to said shaft only towards the end of the backward stroke of the latter.

3,656,656
CYLINDER POSITIONER
Richard Joseph Maiaro, Yonkers, N.Y., assignor to Ventech Automation Company, Inc., Garnerville, N.Y.
Filed Jan. 18, 1971, Ser. No. 107,326
Int. Cl. B23q *7/12*
U.S. Cl. 221—173 **10 Claims**

A high speed positioner for cylindrically or conical-shaped objects; such as pen caps, barrels, lip stick shells, flashlights or ammunition shells, which will orient and feed the elements supplied from a hopper, with one of the ends of the elements being pointed in a selected direction. A sensing device is provided on the feed bar to select one of the ends of the elements to be pointed downwardly in advance of the other end of the element into an orienting chamber for delivery to a vertically extending discharge chute. Other sensing devices and micro switches are provided in the positioner to control the operation of solenoid-operated air cylinder devices and air injectors used in positioning the work cylinder elements. The passing of the cylinder elements through the orienting chamber and the delivery tube can be observed through a transparent door closed thereover. A safety door at the bottom of the vertical chute is automatically opened to prevent a jamming of the cylinder elements at the lower end of the delivery chute, and by which access can be had to the chute,

and by which a faulty element can be removed prior to being ejected from the lower end of the chute onto a pin or



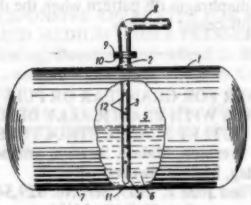
between jaws of a rotating table of machine on which work is to be performed by the machine upon the cylinder element.

3,656,657

APPARATUS FOR DISPENSING FLUID MIXTURES IN UNIFORM PROPORTIONS FROM PRESSURE CONTAINERS

Burton F. B. Smith, Madison, and John M. Siegmund, Morris Plains, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed June 17, 1969, Ser. No. 833,945
Int. Cl. B65d *83/14*
U.S. Cl. 222—4 **16 Claims**



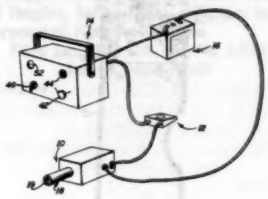
An improvement in apparatus for dispensing mixtures of fluids having different vapor pressures, held under pressure in liquid and gas phases, in uniform proportions, from a pressurized container comprising the conventional elements of a pressure container, a perforated dip-tube extending within the pressure container through the vapor and liquid spaces of the container when charged and terminating in a closed free end in proximity to a wall of the pressure container, and means to provide controlled fluid flow from within the pressure container. The improvement comprises providing a bottom orifice in the dip-tube, substantially at the end of the dip-tube which terminates in the liquid space of the container when charged with fluid, and at least one upper orifice smaller in diameter than the bottom orifice located in the dip-tube at points corresponding to the levels at which from about 10–90 percent volume of the full charge of liquid is present in the pressure container. The apparatus is particularly suited for removing non-azeotropic refrigerant mixtures from pressurized containers in which such mixtures are stored and dispensed.

3,656,658

INTRUSION PROTECTION SYSTEM

Silve J. Iannetti, 735 Moody Street, Waltham, Mass.

Filed Oct. 15, 1969, Ser. No. 866,669
Int. Cl. B67b *7/24*
U.S. Cl. 222—5 **7 Claims**



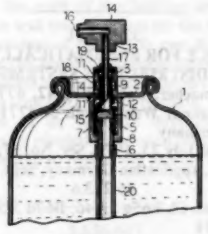
A tear gas gun is mechanically maintained in a normally cocked position by an electrical resistor connected at one end to a firing pin while the opposite end of the resistor is secured to a stationary surface. The firing pin has a projection extending therefrom which is normally engaged by an electromagnetic latch. The latch is mounted on the plunger of a solenoid energized to cause displacement of the latch to a release position. An electrical control unit has a firing switch connected to the resistor for causing burn-out and disintegration of the resistor upon energization of the solenoid thereby permitting firing action by the firing pin.

3,656,659

PRESSURE-FLUID SPRAY DEVICE WITH PRESSURE INDICATOR

Mitsuo Ishida, 9, Ageba-cho, Shinjuk-ku, Tokyo, Japan

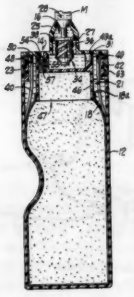
Filed Apr. 13, 1970, Ser. No. 27,530
Int. Cl. B67d *5/22*; B67b *7/26*
U.S. Cl. 222—49 **9 Claims**



A spray device includes a vessel containing a pressurized fluid. A valve located exteriorly can be actuated for permitting escape of fluid from the vessel. An indicating arrangement is integrated with the valve and includes a member provided with viewable markings indicating satisfactory or unsatisfactory pressure conditions in the vessel, this member being slidable between portions in which the respec-

tive markings are exposed to view, in response to changes in the pressure conditions prevailing in the vessel.

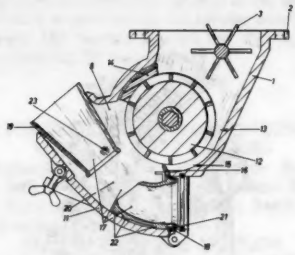
3,656,660
CLOSURE MEMBER AND DISPENSING DEVICE
John J. Mueller, Richmond Heights, Ohio, assignor to Air-Ject Corporation, Richmond Heights, Ohio
Filed Nov. 17, 1969, Ser. No. 877,138
Int. Cl. B65d *35/22*
U.S. Cl. 222—94 **10 Claims**



A closure member, for use with a flexible, resilient, container. The closure member provides an inlet orifice and an outlet orifice to the container and an expansible chamber for containing displacement fluid. The outlet orifice is constructed to communicate directly with the interior of the container, to permit outflow of material when the container is squeezed, and to prevent inflow of displacement fluid. The inlet orifice is constructed to communicate with the expansible chamber, to permit inflow of displacement fluid to the expansible chamber when the container wall returns to original shape after being squeezed, and to prevent outflow of displacement fluid. A flexible bladder, initially collapsed, forms the expansible chamber. The closure member includes structure to which the bladder is attached and which contains the initially collapsed bladder, and structure that inhibits the bladder from sealing off the outlet orifice from the contents of the container. The structure that contains the initially collapsed bladder can be elongated to limit the extent to which the container can be flexed.

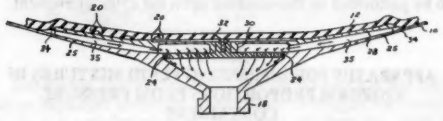
3,656,661
DOSAGE DEVICE FOR PNEUMATICALLY OPERATING DISTRIBUTION SYSTEMS
Ferdinand Schumacher, Coesterweg 42, 477 Soest; Heinrich Weiste, and Helmut Weiste, both of 4771 Sieningsen near Soest, all of Germany
Filed July 23, 1970, Ser. No. 57,463
Claims priority, application Germany, Sept. 12, 1969, P 19 46 213.6
Int. Cl. B65g *53/46;* **B67d** *5/54*
U.S. Cl. 222—194 **1 Claim**

A measuring device for a pneumatically operated system for spreading granular material wherein the material is introduced into an intake funnel having a bottom outlet opening, with a compartmentalized dosage disk rotatably mounted therein, the disk having a discharge side leading to an air duct with an ejector unit mounted therein to form a low pressure area adjacent the discharge side. The discharge side of the disk is sealed by a simple, flexible lip seal and the reverse side is sealed by a wider gasket operating against the circumferential edges of the disk compartments. The ejection unit includes a trap nozzle for introducing air flow into the air duct, an extension piece spaced downstream therefrom, and



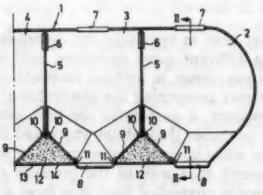
a feeder opening between them for said granulated material being discharged from said disk.

3,656,662
EXPULSION TANK COLLECTOR PLATE
Richard G. Peterson, Littleton, Colo., assignor to The United States of America as represented by the Secretary of the Air Force
Filed May 27, 1970, Ser. No. 40,974
Int. Cl. B67d *5/54*
U.S. Cl. 222—386.5 **1 Claim**



In a positive expulsion tank having a ribbed diaphragm provided within the tank wherein a fluent material admitted to the chamber on one side of the diaphragm forces liquid, in the chamber on the other side of the diaphragm, through the outlet port. A circular collector plate is secured to the tank outlet plate and is spaced from the wall of the tank to provide an annular collection channel which encompasses the center of the diaphragm rib pattern when the diaphragm is at its maximum off-center position.

3,656,663
CONTAINER FOR GRANULAR OR PULVERULENT MATERIALS WITH ELASTICALLY DEFORMABLE OUTLET FUNNEL STRUCTURE
Kjell Charles Svensson, Malmo, Sweden, assignor to Tankmobil Aktiebolag, Malmo, Sweden
Filed June 2, 1969, Ser. No. 829,547
Int. Cl. B67c *11/00*
U.S. Cl. 222—460 **4 Claims**



The present invention relates to improvements in a transport container for granular and pulverulent materials which

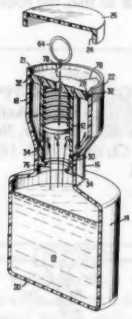
can be fluidized for discharging purposes by increasing the air pressure within the container.

3,656,664

APPARATUS FOR SAFELY STORING AND DISPENSING HAZARDOUS FLUENT MATERIALS

John E. Kelly, R.F.D. #3, Gaithersburg, Md.

Filed Mar. 16, 1970, Ser. No. 19,724
Int. Cl. B67d 3/00
U.S. Cl. 222—518 6 Claims



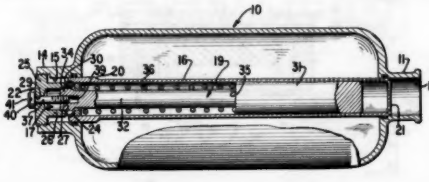
An apparatus is provided for the safe dispensing of hazardous fluent materials which apparatus includes a valve mechanism which must be hand operated in a deliberate manner. The valve mechanism is so disposed with respect to the dispensing portion of the apparatus that an operator's hand substantially covers the dispensing portion of the apparatus while the valve is held open. In this manner, it is difficult, if not impossible, for an operator to place his mouth over the dispensing portion of the apparatus for oral ingestion while his hand is operating the valve mechanism.

3,656,665

INERTIA RESPONSIVE APPARATUS FOR SUPPLYING FLUID MEDIUM UNDER PRESSURE

William T. Fleming, Boonton, and Alfred J. Munn, Wayne, both of N.J., assignors to Walter Kidde & Company, Inc., Belleville, N.J.

Filed Apr. 14, 1970, Ser. No. 28,309
Int. Cl. B60r 21/08; F16k 17/36
U.S. Cl. 222—500 10 Claims



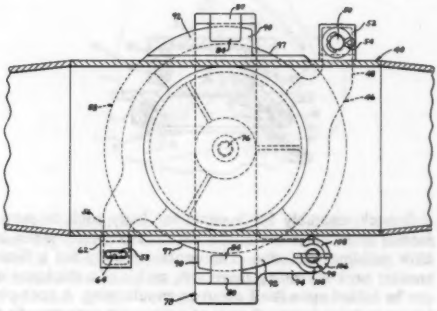
Apparatus for supplying fluid medium under pressure in response to a predetermined rate of change in velocity including a container of fluid medium under pressure and an inertia responsive valving arrangement positioned within the container. The container is provided with an outlet opening and a larger diameter second opening aligned therewith. A stepped hollow cylindrical valve member extends between the two openings and is pressure biased toward the second opening to overcome the friction of the seals at the openings. The valve member is held in the closed position by a ball locking arrangement provided at the second opening. An inertia sensitive mass is positioned within the hollow valve member to unlock the locking arrangement in response to a sudden change in the velocity of the container.

3,656,666

REMOVABLE LOWER COVER FOR HOPPER DISCHARGE OUTLET STRUCTURE

Richard H. Dugge, St. Louis County, and Garth R. Smith, Maryland Heights, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jan. 19, 1970, Ser. No. 3,858
Int. Cl. B65d 47/00
U.S. Cl. 222—556 3 Claims



A lower cover for a bottom discharge outlet structure of a hopper, particularly for a covered hopper railway car, positioned beneath a butterfly valve which controls the discharge of lading from the hopper. A locking arm is pivotally carried from the underside of the cover and a cam type lock is effected between the ends of the locking arm which extend beyond the cover and coacting lugs on the adjacent housing whereby upon rotation of the arm in one direction when the cover is beneath the bottom discharge opening the cover is drawn tightly against the housing in generally air-tight relation to releasably lock the cover in position. Upon rotation of the locking arm in an opposite direction, the cover is released and may be pivoted to an open position remote from the discharge opening to permit the gravity unloading of lading.

3,656,667

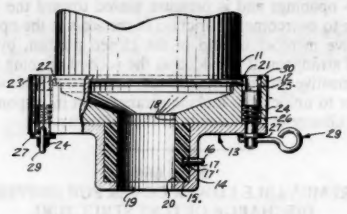
RESEALING DEVICE

Henry Albert Johansen, 10244 Bel Air Street, Montclair, Calif.

Filed Aug. 10, 1970, Ser. No. 62,364
Int. Cl. B67d 47/28
U.S. Cl. 222—561 1 Claim

The device for dispersing coffee in predetermined amounts. This device includes a container portion held in place on a rubber seal ring within the base of the device, the flange serving to hold the container in place by spaced apart

locking pins having handle means for rotating them so as to engage the lip portion of the head on top of the flange.



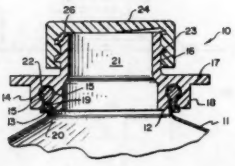
The bottom includes a slide pin and slide for covering and uncovering the opening of the dispenser.

3,656,668

NECK ASSEMBLY FOR THIN WALLED CONTAINER

Wolfgang Liebertz, Wilmington, Del., assignor to Container Corporation of America, Chicago, Ill.

Filed Sept. 11, 1969, Ser. No. 856,986
Int. Cl. B65d *35/44*
U.S. Cl. 222—570 **1 Claim**



A neck assembly for a container body such as may be formed from polymers of the unsaturated olefin series in a blow molding operation. The container body has a flexible annular neck extending therefrom, and is of a thickness that can be folded upon itself about an annular ring. A neck piece has an annular groove therein of a diameter corresponding to the diameter of the annular ring and the folded over portions of the annular neck together with the annular ring are inserted into the annular groove with an interference fit.

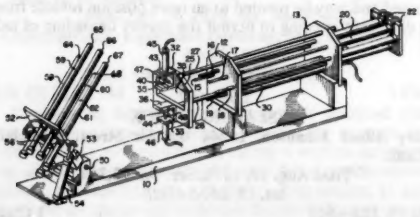
The annular groove is undercut to cooperate with a land on the annular ring to provide a tightly locking assembly.

3,656,669

GLOVE TURNING APPARATUS

Clayton E. Conklin; Antonio Ledesma, Jr., and Moises R. Bautista, all of El Paso, Tex., assignors to Wells Lamont Corporation, Chicago, Ill.

Filed Mar. 31, 1970, Ser. No. 24,092
Int. Cl. A41h *43/00*
U.S. Cl. 223—40 **14 Claims**



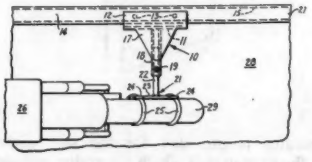
Apparatus is disclosed for turning a glove after the glove has been sewn, stitched or otherwise fastened wrong-side-out, and is to be turned back on itself. The wrong-side-out glove to be reversed or turned is mounted on finger tubes and the finger tubes are then brought into alignment with rods projecting in opposition to the tubes. The finger tubes and the oppositely positioned rods are grouped and aligned to permit insertion of either set into the fingers and thumb of the glove to be turned, depending on whether the glove is wrong-side-out or right-side-out. After the glove is mounted on the finger tubes, the opposing rods are brought towards the tube tips such that the ends of the rods are in contact with or adjacent to the tips of the fingers and thumb of the mounted glove. The wrist portion of the glove is reversed for a short distance to permit gripping thereof by means movable in either direction parallel to the orientation of the tubes and rods. The latter means is then retracted to pull the glove backward over the rods so that the rods enter the fingers and thumb of the glove.

3,656,670

MOTORCYCLE SUPPORT

Eugene Hill, 215 North High Street, Antlers, Okla.

Filed June 30, 1970, Ser. No. 51,068
Int. Cl. B60r *9/02, 11/00*
U.S. Cl. 224—42.45 R **4 Claims**



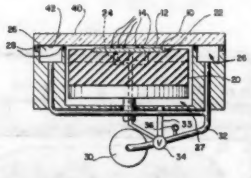
The present invention relates to a motorcycle support in which a bracket is detachably secured to the top edge of the side of a pick-up body and an adjustable member projects inwardly therefrom. The adjustable member engages the side of the motorcycle tire and straps secured to the adjustable member encompass the tire to secure the motorcycle tire and wheel thereto. A pair of supports are required for securing a motorcycle in a pick-up truck body.

3,656,671

FRANGIBLE PROJECTION REMOVAL

Richard J. Bratek, Burlington, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 16, 1970, Ser. No. 19,675
Int. Cl. B26f *3/00*
U.S. Cl. 225—1 **16 Claims**



Frangible epitaxial projections on a semiconductor wafer which is susceptible to abrasive damage are removed by forcing a rigid glass plate toward the projections and surfaces of the wafer, with pressures sufficient to break projections extending greater than two microns from the surface. Vacuum

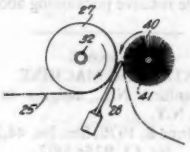
greater than about 25 inches of mercury is used to pull the plate down on the projections. After the plate is removed from the wafer, broken projections are removed by washing the chip sequentially in ultrasonically vibrated baths.

3,656,672

METHOD FOR SPLITTING ORIENTED PLASTIC MATERIALS INTO FIBROUS STRUCTURES

Frank Kalwaites, Somerville, N.J., assignor to Johnson & Johnson

Division of Ser. No. 710,532, Mar. 5, 1968, Pat. No. 3,520,458
Filed Aug. 11, 1969, Ser. No. 870,876
Int. Cl. B26f *3/02*
U.S. Cl. 225—3 5 Claims



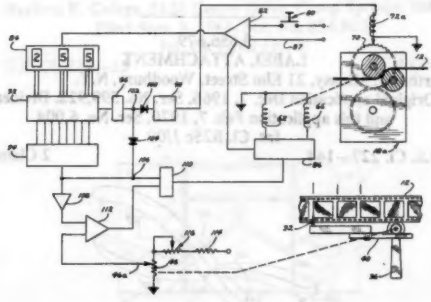
This is a method and apparatus for splitting oriented plastic sheet materials such as films, ribbons, etc. into fibrous structures. The material to be split is moved in a first direction. The direction in which the material is moving is changed so that the second direction makes an acute angle with the first direction. Simultaneously with the change in direction or movement of the material a plurality of disruptive forces are applied to the material substantially in the direction of the movement of the material to split the oriented material into a fibrous structure.

3,656,673

METHOD AND MEANS OF ACCURATELY POSITIONING FILM IN A FILM PROCESSING MECHANISM

Glenn D. Erickson, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sept. 21, 1970, Ser. No. 74,011
Int. Cl. B65h *23/04, 17/10*
U.S. Cl. 226—2 11 Claims



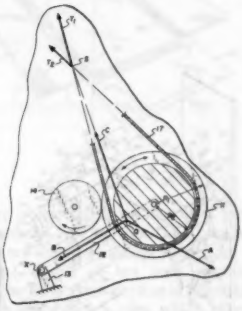
This invention is a film feed control for a film advancement mechanism to accurately position a particular film frame for processing by using the film frame location prior to advancement to determine a sequential cycle of film advancement in which each film frame is first advanced and a minimum predetermined distance by actual measurement and then, without stopping, is advanced a further distance using a timer to control the end of the film advancement cycle by measuring an increment of time for further film advancement determined for each frame based on frame position prior to the start of the advancement cycle.

3,656,674

WEB TENSION ISOLATOR OR AMPLIFIER FOR WEB HANDLING APPARATUS

John E. Morse, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 18, 1970, Ser. No. 20,612
Int. Cl. G11b *15/43*
U.S. Cl. 226—25 8 Claims



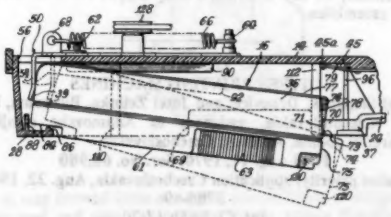
A web tension isolator or amplifier includes a rotatable pulley engageable with a driver pulley in response to tension forces in a web that is wrapped on the driven pulley. The mechanism maintains the film tension ratio (i.e., the ratio of the tensions in the web portions on the two sides of the driven pulley) substantially constant regardless of the magnitude of the web tension. The mechanism automatically and quickly adjusts the web tension for any variations in the tensions of the web portions at either side of the driver pulley. The mechanism can be used (for example) in a motion picture projector between the film gate and a supply reel and/or a take-up reel.

3,656,675

FILM CARTRIDGE GUIDE ASSEMBLY

George J. Zahradnik, Wheaton, Ill., assignor to A. B. Dick Company, Chicago, Ill.

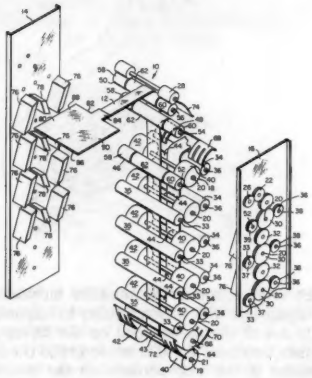
Filed June 19, 1970, Ser. No. 47,660
Int. Cl. G03b *1/56*
U.S. Cl. 226—89 12 Claims



In a movie projector designed to receive and operate with a film cartridge, where the film cartridge housing is con-

structed with guiding surfaces that cooperate with complementary guide surfaces in the cartridge receptacle of the movie projector to cause the cartridge to follow a predetermined path when inserted or removed from the receptacle in order that the film cartridge will always be brought into a proper operating relationship with the various operating components of the movie projector.

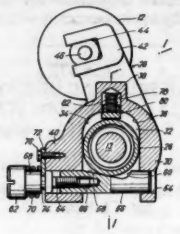
3,656,676
FILM TRANSPORT ROLLER SYSTEM
Henry E. Hope, 195 Welsh Road, Huntingdon Valley, Pa., and Stephen F. Hope, 2321 Wyandotte Road, Willow Grove, Pa.
Filed Dec. 3, 1970, Ser. No. 94,823
Int. Cl. G03d *3/12*
U.S. Cl. 226—92 **10 Claims**



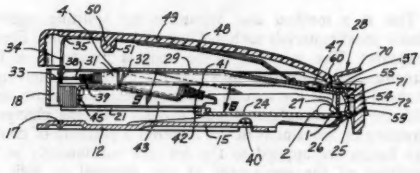
A film transport roller system for conveying an elongate web of film through processing tanks including a plurality of juxtaposed rack assemblies, each having a plurality of pairs of rollers and film guides which cooperate to drive the film through the processing tanks without tensioning or otherwise stressing the film. The medial section of one roller of each pair of cooperating rollers is fabricated to a reduced diameter to form an annular film receiving area, wherein the film may be guided through the various processing tanks without stress. The transverse ends of the pairs of cooperating rollers tangentially co-act to automatically thread the film through rack assemblies.

3,656,677
OFFSET PRINTING MACHINES
Karel Stepanek, Drnovice, and Josef Zelinka, Bukovina, both of Czechoslovakia, assignors to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia
Filed Aug. 11, 1970, Ser. No. 62,980
Claims priority, application Czechoslovakia, Aug. 22, 1969, 5788-69
Int. Cl. B65h *17/20*
U.S. Cl. 226—180 **10 Claims**

Apparatus for mounting distributor and dampening rollers in an offset printing machine. The distributor roller is journaled in a bearing secured in fixed bushing and the dampening roller is mounted on an arm extending from a body surrounding the bushing. The body is provided with key means permitting adjustable rotative positioning about the bushing.

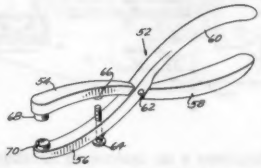


3,656,678
STAPLING MACHINE
Henry Ruskin, Cranford, N.J., assignor to Swingline Inc., Long Island City, N.Y.
Filed June 8, 1970, Ser. No. 44,292
Int. Cl. B25c *5/02*
U.S. Cl. 227—128 **12 Claims**



A stapling machine is shown having a base of springable material having a clearance spring integrally formed therein, a magazine made of springable material and having spaced sides also has a base portion and a rearwardly projecting spring member. A follower is formed with a body portion and a downwardly projecting forward portion having a pair of opposite laterally projecting members which are in slidable closely adjacent relationship with the sides of the magazine, a cover overlies the magazine and is formed with a longitudinal channel therewithin. A tapered coil spring is connected to the cover and the follower. A latch is provided with actuating means which are selectively engageable with complementary fastening means upon the rearwardly projecting spring member of the magazine.

3,656,679
LABEL ATTACHMENT
Arthur J. Minasy, 21 Elm Street, Woodbury, N.Y.
Original application Dec. 7, 1966, Ser. No. 599,922. Divided and this application Feb. 7, 1970, Ser. No. 6,004
Int. Cl. B25c *1/00*
U.S. Cl. 227—144 **2 Claims**



A label attachment arrangement comprising a tack-like element whose shank passes through a label and an article of

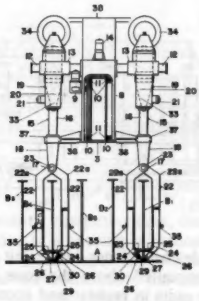
merchandise. The shank is encased by and interlocked in a button. A plier-like attachment tool and a cutting tool for label removal.

3,656,680

APPARATUS FOR SIMULTANEOUSLY WELDING PAIRS OF REINFORCING PLATES TO A BASE PLATE

Hirokazu Nomura, Yokohama, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 20, 1970, Ser. No. 21,395
Int. Cl. B23k *19/00*
U.S. Cl. 228—44 5 Claims



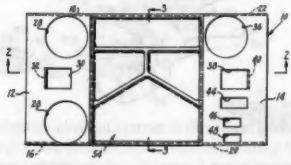
An apparatus for welding reinforcing plates to a base plate. Two pairs of welding means respectively simultaneously deposit fillet welds at all four corners defined between the lower edges of a pair of upright reinforcing plates and the upper surface of a main base plate engaged by these lower edges, so that a pair of T-welds are simultaneously formed between the two reinforcing plates and the main base plate. After one pair of reinforcing plates are simultaneously welded in this manner to the main base plate, a second pair of reinforcing plates are simultaneously welded in the same way to the main base plate, so that pairs of T-welds are formed successively between pairs of the reinforcing plates and the main base plate.

3,656,681

DISPOSABLE TRAY

Harford E. Goings, 5428 Center Drive, Camp Springs, Md.

Filed Sept. 3, 1969, Ser. No. 854,902
Int. Cl. B65d *11/10*
U.S. Cl. 229—15 4 Claims



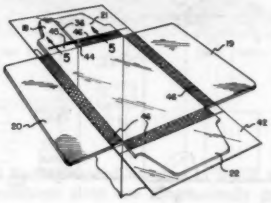
A food tray, pressed or stamped from plastic, is provided with dividing partitions for different types of food, etc., and is adapted to be pressed into and held by friction within a correspondingly shaped recess in a base tray.

3,656,682

DRUMHEAD FOR END SEALED CARTONS AND METHOD OF MAKING THE SAME

Lawrence E. Giuliani, Rockford, Ill., assignor to Riegel Paper Corporation, New York, N.Y.

Filed Oct. 1, 1970, Ser. No. 77,231
Int. Cl. B65d *5/08*
U.S. Cl. 229—37 R 5 Claims



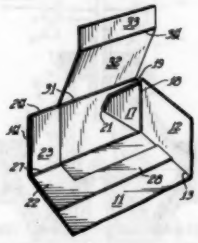
This disclosure is directed to an improved method of construction of drumhead type cartons (i.e., parallelepiped cartons whose ends are sealed by independent, taut membranes) in which a fillet means of hot melt material having a generally right triangular cross section is deposited along that portion of the manufacturer's joint which extends into the carton dust flaps to provide an uninterrupted peripheral surface to which the membrane ma be tightly adhered. Absolute tightness at the joint is enhanced by simultaneously cross-crushing and cross-sealing the membrane, fillet, and underlying flap portions by a specially configured sealing platen.

3,656,683

TRAY

John D. Desmond, Philadelphia, Pa., and David L. Bottorman, Greensboro, N.C., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 30, 1970, Ser. No. 7,159
Int. Cl. B65d *5/24*
U.S. Cl. 229—31 2 Claims



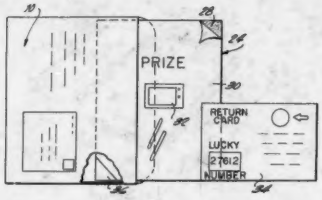
A tray formed from a cut and scored blank. Contiguous of the end and side panels have gusset panels therebetween which fold upon themselves when the side and end panels are erected. The end panels have a locking structure consisting of a central locking panel foldable with respect to the end

panel and secured to the tray bottom. Panel portions flanking the locking panel are folded to position upon carton erection, and the distal ends thereof cooperate with the locking panel and maintain the gusset folds and sides in erected position.

3,656,684
COMPOSITE MAILING PACKAGE AND METHOD OF PREPARING SAME

Desmond Meehan, 250 Grath Road, Scarsdale, N.Y.

Filed Nov. 19, 1970, Ser. No. 91,074
Int. Cl. B65d *27/04*
U.S. Cl. 229—92.8 **4 Claims**

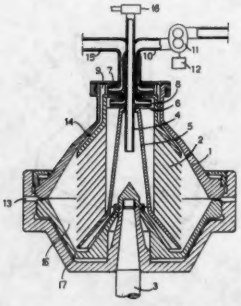


A composite mailing package comprising an envelope having a view window provided therein and a mountable plaque within said envelope. Said plaque having a front face including a pictorial image thereon and a rear face having a layer of pressure-sensitive adhesive. A removable combined protective backing and advertising sheet is positioned over and in removable engagement with said pressure-sensitive adhesive and contains the advertising message on its outer face. The removable backing sheet may be stripped from said plaque to expose said pressure-sensitive adhesive for mounting said plaque on a support surface.

3,656,685
CENTRIFUGE

Ove Allan Valentin Kjellgren, Stockholm, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

Filed Jan. 8, 1969, Ser. No. 789,865
Claims priority, application Sweden, Jan. 9, 1968, 232/68
Int. Cl. B04b *11/00*
U.S. Cl. 233—19 **3 Claims**

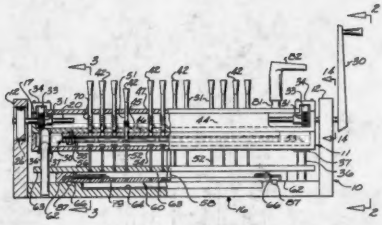


A centrifugal rotor is provided with an inlet for a mixture of two liquid components to be separated from each other and of which one component is high viscous, the rotor also having outlets for the respective separated components. A displacement pump is inserted in the discharge pipeline of a paring means which forms the outlet for the highly viscous component, and the throughput capacity of this pump is adjustable during operation to control the discharge of the two separated components from the rotor.

3,656,686
PUNCHING DEVICE

James R. Lee, 249 West Jewel, Kirkwood, Mo., and James V. De Lurgio, 1924 Berra Court, St. Louis, Mo.

Filed Mar. 3, 1970, Ser. No. 16,158
Int. Cl. G06k *1/08*
U.S. Cl. 234—1 **21 Claims**

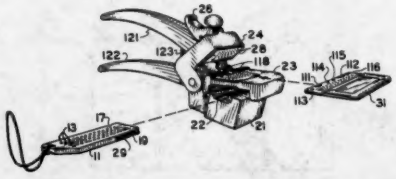


This punching device includes a base unit and a reciprocating header unit mounted above the base unit. Guide pins maintain the two units in register and eccentric cams, journal-mounted to the header unit and bearing on the base unit, provide the reciprocating mechanism. The header unit carries a key bank and selected, individual keys may be depressed to lock associated punch elements in position below the header unit. When the header unit is lowered, the locked punch elements perforate a stack of test papers carried by the base unit, and provide punch holes at specific locations on each test paper corresponding to correct answers in a multiple choice quiz. The header unit includes a cam actuated release mechanism which releases all of the locked key punch elements simultaneously.

3,656,687
DATA SYSTEM FOR MEDICAL AND OTHER ENVIRONMENTS

Russell H. Romney, 3259 Bon View Drive, Salt Lake City, Utah, and Billy M. Jensen, 8129 South 1475 East, Sandy, Utah

Continuation of application Ser. No. 772,622, Nov. 1, 1968, now abandoned. This application Oct. 24, 1969, Ser. No. 868,982
Int. Cl. G06k *1/08*
U.S. Cl. 234—2 **5 Claims**



For maintaining error-free records in hospitals and other environments, a master identification tab or device for a primary subject or object receives indicia including coded information and later the coded information is directly transferred

to a dependent identification tab or device which in turn is affixed to a subordinate subject or object. Thus, manual transfer of information is avoided and high accuracy assured. Additional data may be recorded on the dependent identification tab. When the present system is used in hospitals, the primary subject may be a patient and the subordinate subject may be a prescription container, a specimen tube or the like.

3,656,688

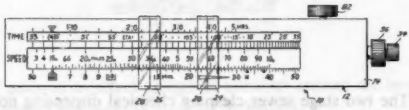
AIRCRAFT COMPUTER

William J. Camp, 14 B Glendale Manor, Pleasantville, N.J.

Filed Dec. 29, 1969, Ser. No. 888,269

Int. Cl. G06c *3/00*

U.S. Cl. 235—86 **9 Claims**



A device for instantly computing time, distance and fuel in an aircraft consisting of a housing, a vertically movable tape and a horizontally movable tape. The vertically movable tape indicates time and the horizontally movable tape indicates distance and fuel. The indicia on both tapes work in conjunction with indicia on the face of the housing.

3,656,689

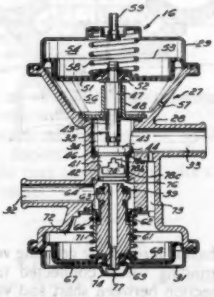
MODULATING VALVE

Tadeusz Budzich, Moreland Hills, and Hiralal V. Patel, Cleveland, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Dec. 16, 1970, Ser. No. 98,595

Int. Cl. F24d *3/02;* **B60h** *1/08*

U.S. Cl. 237—8 **15 Claims**



A vehicle heater control system is disclosed which includes a flow control valve in which pressure regulating means provide a constant pressure drop across a metering valve to insure accurate flow rates. The metering valve is adjustably positioned by a vacuum suspension system. The vehicle operator controls the position of the metering valve and the flow rate therethrough by controlling the valve of a control vacuum supplied to the metering valve actuator.

3,656,690

RAILBED

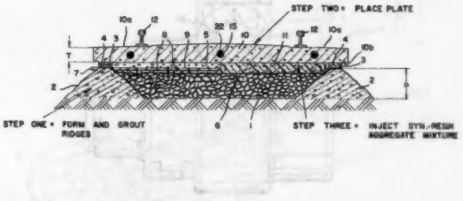
Siegfried Hanig, Peine, Germany, assignor to Ilseder Hutte, Peine am Hannover, Germany

Filed Mar. 23, 1970, Ser. No. 21,953

Claims priority, application Germany, Mar. 22, 1969, P 19 14 712.7

Int. Cl. E01b *1/00*

U.S. Cl. 238—2 **5 Claims**



A railbed for high-speed railways in which a plurality of elongated concrete slabs are longitudinally prestressed in groups with cast synthetic-resin sealing strips between the adjoining ends of the concrete slabs. The slabs are laid over a hollow bed and are cushioned below with a hard-foam synthetic resin including expanded mineral filters, the foamable synthetic resin being injected through perforated ducts. The downward force is supported by a pair of longitudinally extending sills flanking the hollow and carrying the concrete-slab platform via sealing strips. The sills may be formed in situ by grouting mounds of loose stone or may be cast monolithically with the remainder of the bed.

3,656,691

WASHER SYSTEMS FOR CLEANING SURFACES

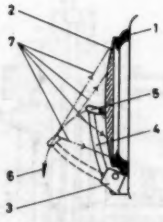
Leif Roland Norstrand, Malmo, Sweden, assignor to Monark-Crescent Aktiebolag, Varberg, Sweden

Filed Mar. 20, 1970, Ser. No. 21,274

Claims priority, application Sweden, Apr. 2, 1969, 4684/69

Int. Cl. B05b *1/10;* **B60s** *1/46*

U.S. Cl. 239—284 **9 Claims**



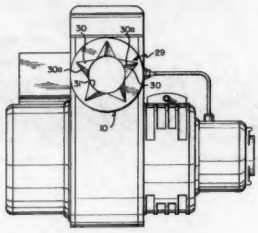
A washer system for cleaning surfaces such as automobile headlights directs jets or shots of liquid from a nozzle against the dirty surface. The nozzle is spring-biased toward the surface to be cleaned, and each shot moves the nozzle by jet reaction from the start position near the surface to a position farther away from the surface along a path such that the sprayed area progressively increases concentrically outwardly. The spring returns the nozzle to the start position between shots.

3,656,692

OIL BURNER

Norman E. Flournoy; Julian H. Dancy, both of Richmond, and Raymond Trippet, Highland Springs, all of Va., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 5, 1971, Ser. No. 104,044
Int. Cl. B05b 7/10
U.S. Cl. 239—405 4 Claims



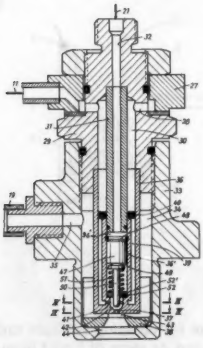
A gun type oil burner provided with a conventional lily having flow-directing blades which provide a rapidly swirling rotation of air within the blast tube, the improvement involving the provision of a partition plate upstream of the lily to provide a substantial increase in operating pressure upstream thereof, and with jet orifices specifically aligned with the flow-directing surfaces of the lily so as to direct high velocity jets of air on to the flow-directing surfaces in such a way as to maximize the swirl in the blast tube.

3,656,693

FUEL INJECTION NOZZLE FOR EXTERNALLY IGNITED INTERNAL COMBUSTION ENGINES

Konrad Eckert, Stuttgart-Bad Cannstatt, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed July 9, 1970, Ser. No. 53,587
Claims priority, application Germany, July 9, 1969, P 19 34 704.7
Int. Cl. B05b 7/12
U.S. Cl. 239—410 5 Claims



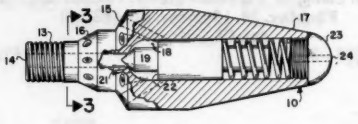
In a fuel injection nozzle there is disposed a valve member which, during normal operation, maintains the nozzle open but which, when actuated by a control liquid admitted to the nozzle in a control conduit, hermetically obturates the nozzle opening.

3,656,694

SEWER CLEANING CHEMICAL DISPENSING NOZZLES

John A. Kirschke, P.O. Box 125 Ammann Road, Boerne, Tex.

Continuation-in-part of Ser. No. 36,901, May 13, 1970. This application Dec. 10, 1970, Ser. No. 96,723
Int. Cl. B05b 1/14
U.S. Cl. 239—533 5 Claims



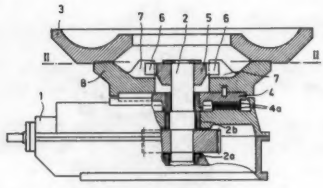
The two stage sewer cleaning chemical dispensing nozzle particularly adapted for utilization in dispensing root fumigant. The nozzle incorporates an internal spring loaded pressure responsive valve for selectively activating rearward or forward jets as desired for propulsion, cleaning, or chemical fumigant dispensing.

3,656,695

ROLLER MILL WITH ROTATING GRINDING VESSEL

Ottmar Bacharach, Kaiserslautern, Germany, assignor to Gebr. Pfeiffer Barbarossawerke AG, Kaiserslautern am Pfalz, Germany

Filed June 12, 1970, Ser. No. 45,856
Claims priority, application Germany, June 12, 1969, P 19 29 912.8
Int. Cl. B02c 15/00, 4/42
U.S. Cl. 241—103 2 Claims



A roller mill having a rotatable grinding vessel with a drive shaft for the grinding vessel connected to a transmission where the connection between shaft and vessel is non-positive or interruped.

3,656,696

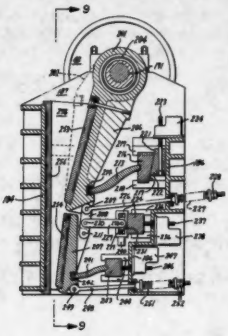
MOBILE ROCK CRUSHING APPARATUS

Richard P. Mailliard, 604 Lorna Street, Redding, Calif.

Original application June 16, 1967, Ser. No. 646,630, now Patent No. 3,510,073, dated May 5, 1970. Divided and this application Dec. 4, 1969, Ser. No. 879,966
Int. Cl. B02c 1/06
U.S. Cl. 241—155 4 Claims

A vertical, two-stage rock crusher with inter-linked upper

and lower movable jaws including a provision for shifting the

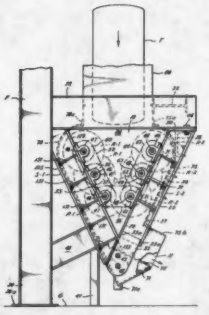


link position to effect change in the inlet area of the lower jaw and its amplitude of crushing oscillation.

3,656,697
TIRE PULVERIZER

David J. Nelson, Route 17, P.O. Box 915 16914 Creeksouth, Houston, Tex.

Filed June 11, 1970, Ser. No. 45,315
Int. Cl. B02c *49/20*
U.S. Cl. 241—222 **9 Claims**



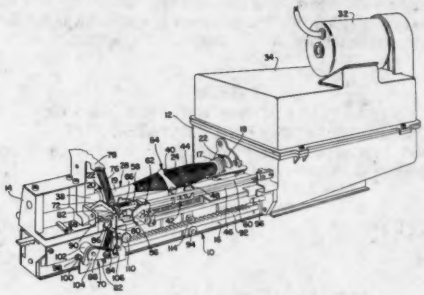
A tire pulverizer adapted to receive and cut automobile, truck or other vehicle tires into small particles, wherein the pulverizer has a plurality of rows of interfitting abrading rotating blades disposed in substantially a V-shape and through which the tires are fed as they are cut into the small particles by the blades.

3,656,698
WINDING APPARATUS

Robert E. Morton, Warwick, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed Oct. 30, 1970, Ser. No. 85,412
Int. Cl. B65h *54/14*
U.S. Cl. 242—27 **8 Claims**

A winding machine, such as UNIFIL loom winder, manufactured by Leesona Corporation, Warwick, Rhode Island 02887, has a spindle assembly for receiving and rotating a bobbin, and a transversing assembly including a transversing member releasably threadedly secured to a traverse rod, during winding, for guiding a strand of yarn being wound onto a bobbin. Upon completion of winding of a bobbin, the spindle assembly is stopped and the transversing member is released from the traverse rod and is returned to its starting point as the yarn is cut between the traversing member and the doffed, filled bobbin and is engaged for winding onto an empty bobbin previously donned onto the winder. The traversing and spindle assemblies are driven by mechanism within a casing of the winder. This mechanism includes a continuously driven drive shaft releasably connected by a clutch with a spindle shaft. A power take-off including a worm on the spindle shaft drives cam rotatably received on

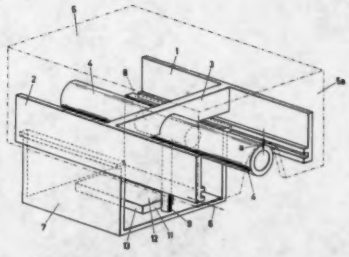


the spindle shaft for rotating and reciprocating the threaded traverse rod to provide the traversing member with builder and reciprocating motions. The cams and worm are effectively held against axial movement along the spindle shaft by a rigid member in abutting relationship with an end of the cams and adjustably fixed to the casing, and a noise deadening member mounted on the rigid member and holding the worm. When the traversing member has been returned to its starting position, the clutch again drivingly engages the drive shaft and spindle shaft whereupon the cycle is repeated.

3,656,699
TOILET PAPER DISPENSER

Conrad W. Schnyder, 9497 Triesenberg, Liechtenstein, and Katrin Schnyder, Germaniastrasse 64, 8006 Zurich, both of Switzerland

Filed Jan. 5, 1971, Ser. No. 104,022
Claims priority, application Switzerland, Aug. 24, 1970, 12639/70; Jan. 6, 1970, 47/70
Int. Cl. B65h *19/04*
U.S. Cl. 242—55.3 **5 Claims**



A toilet paper dispenser is disclosed in which two rolls of toilet paper may be mounted on the two free ends of a rod-form support. At any one time one of these two rolls is enclosed in the housing of the dispenser by means of a displaceable covering wall, whereas paper may be withdrawn from the other roll. The rolls are retained on the support by side walls of a housing cover which approach the free ends of the support. Small gaps between these side walls and the ends of the support allow removal of a practically empty roll core, but not of a full roll. As long as the uncovered roll is retained

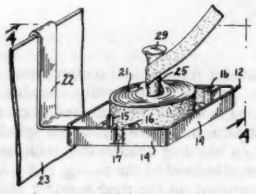
by the respective side wall this roll in turn prevents a movable abutment member from being moved out of a center position in which this abutment member radially projects from the support and cooperates with stop surfaces on the displaceable covering wall to preclude uncovering of the covered roll. Thus the covered roll can be uncovered only when the empty core of the other roll can be removed, allowing motion of the abutment means. A fresh roll may thereafter be inserted in place of the removed empty core, and this fresh roll will then, of course, be covered by the covering wall. Apart from the covering wall which may be displaced to either side the dispenser is symmetrical in relation to a central plane at right angles to the support.

3,656,700

APPARATUS FOR WINDING STORING AND DISTRIBUTING PUNCHED PAPER TAPE

Robert D. Gauvin, Minneapolis, Minn., assignor to Metro Machine & Engineering Corp., Minneapolis, Minn.

Filed June 24, 1970, Ser. No. 49,265
Int. Cl. B65h *17/02*
U.S. Cl. 242—67.1 **10 Claims**



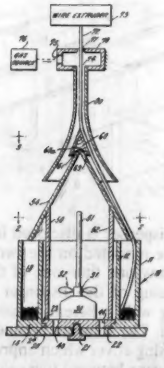
A device for handling punched paper tape is disclosed which consists of a closed cartridge to be selectively used with a reel having a spindle to receive the tape and form it into a roll within the cartridge for storage purposes, or with a mounting bracket that carries the cartridge and permits it to be rotated as tape is withdrawn from the center of the tape roll.

3,656,701

WIRE RECEIVING AND STORING MEANS

James W. Dibrell, Malibu, Calif., assignor to Microwire Corporation, Allentown, Pa.

Filed July 6, 1970, Ser. No. 52,594
Int. Cl. B21c *47/00*
U.S. Cl. 242—83 **9 Claims**



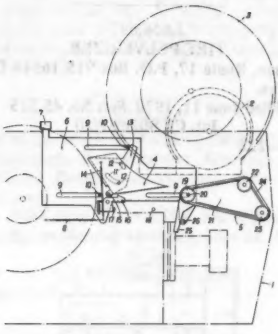
Wire to be wound and stored is drawn through a tube by the viscous drag of a flowing gas. The wire then is passed over a cone and an air stream having an angular component relative to the cone axis causes the wire to rotate over the cone surface. A storage container having an annular chamber is disposed adjacent the wide end of the cone, with the annular opening communicating with the wide end of the cone so that wire is deposited into and wound within the annular chamber.

3,656,702

STRIP-HANDLING APPARATUS

Friedrich Forch, and Erwin Krob, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Oct. 28, 1969, Ser. No. 871,833
Claims priority, application Austria, Oct. 30, 1968, A 10600/68
Int. Cl. G03b *1/04*; **G11b** *15/32*
U.S. Cl. 242—192 **4 Claims**



A cartridge is fixed to a frame and has an exit opening. A coil of strip contained in the cartridge has a leading end which is accessible from the outside of the cartridge and movable out of the same in a predetermined direction through the exit opening. A peeling member carried by the frame is pivotally movable through the exit opening into engagement with a predetermined point of the periphery of the coil. A belt drive has a plurality of rollers and a belt trained around the rollers. The rollers include a drive roller carried by the frame on a stationary axis and operable in a predetermined sense to move the belt in a predetermined direction, and a friction roller. A friction roller mounting is movably mounted in the frame and carries the friction roller and is operable to move the friction roller through the exit opening into engagement with the periphery of the coil at a point which in the direction in which the leading end is movable out of the exit opening precedes the point where the periphery of the coil is engageable by the peeling member. The belt has a belt course which is arranged to move away from the friction roller when the belt moves in the predetermined direction. The peeling member and the belt course define between them a passage arranged to receive the leading end of the strip as it moves out through the exit opening. A slider has the peeling member pivoted thereto and is movable from an initial position to a final position to move the peeling member into the cartridge. A pawl is carried by the slider and arranged to engage the peeling member and hold it clear of the periphery of the coil when said slider is in an intermediate position between the initial and final positions. A

stop secured to the frame is arranged to be engaged by the pawl in the final position of the slider and thus to disengage the pawl from the peeling member. A spring acting between the peeling member and slider tends to urge the peeling member into engagement with the periphery of the coil when the slider is in its final position.

3,656,703

INFORMATION-PROCESSING APPLIANCE FOR USE WITH A STRIPLIKE INFORMATION CARRIER CONTAINED IN A CARTRIDGE

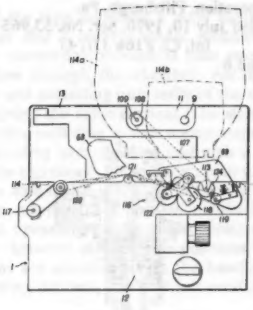
Karl Vockenhuber, Vienna; Gottfried Pammer, Sudstadt Lower; Erwin Krob, Vienna; Friedrich Forch, Vienna; Peter Revy-Belvard, Vienna, and Alfons Valoh, Vienna, all of Austria, assignors to said Vockenhuber, by said Pammer, said Krob, said Forch, said Revy-Belvard and said Valoh

Filed July 15, 1970, Ser. No. 55,203

Claims priority, application Switzerland, July 16, 1969, 11082/69; 11083/69; Aug. 25, 1969, 13092/69; 13093/69; 13094/69; 13095/69

Int. Cl. G03b *1/04*; G11b *15/32, 23/04*

U.S. Cl. 242—192 **91 Claims**



The information carrier is wound on a reel which is contained in a cartridge of either of first and second types. Each of the cartridges has locating and fixing surfaces specific to the type of cartridge. The reel in the cartridges of said first type has a flange. The reel in the cartridges of the second type has a central bore. The cartridges of the second type have a wall formed with an aperture aligned with said bore. The information carrier on said reel has a leading end. The appliance comprises first locating and fixing means adapted to engage said locating and fixing surfaces of any cartridge of said first type so as to hold said cartridge of said first type in an operative position on said appliance, second locating and fixing means adapted to engage said locating and fixing surfaces of any cartridge of said second type so as to hold said cartridge of said second type in an operative position on said appliance, threading means operable to mechanically move said leading end of said information carrier in a cartridge of either of said first and second types when said cartridge is held in said operative position, first reel-driving means adapted to cooperate with said flange and operable to drive said reel in a cartridge of said first type when said cartridge is in said operative position, and second reel-driving means comprising a mandrel adapted to extend through said aperture into engagement with said bore of a reel of a cartridge of said second type when said cartridge is in said operative position. The second reel-driving means are operable to drive said reel in said cartridge of said second type.

3,656,704

CASSETTE TYPE TAPE RECORDER

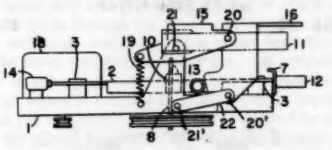
Daihati Ogura, Kyoto, Japan, assignor to Mitsubishi Electric Corporation, Chiyoda-ku, Tokyo, Japan

Filed Nov. 25, 1970, Ser. No. 92,721

Claims priority, application Japan, Nov. 27, 1969, 44/112766

Int. Cl. G03b *1/04*; G11b *15/32, 23/04*

U.S. Cl. 242—198 **6 Claims**



Disclosed herein is a cassette type tape recorder which readily permits insertion and removal of the cassette by a simple operation and further provides high stability against vibration. The tape recorder is operated simply by inserting a horizontally disposed cassette through an inlet provided on an operating panel and pushing down a handle, and the cassette is easily removed by just pushing a releasing button.

The recorder is provided with a magnetic head and a pinch roller on a subordinate base member which is slidably disposed on a main base member. A bridge member having a holder in which the cassette is horizontally inserted is pivotally joined to the main base member through an arrangement of joint shafts and connecting rods for vertically moving the same within the recorder. A cam surface on the bridge member is engaged with a set roller provided on the subordinate base member so that the bridge member is retained in the lower position and the recorder in an operating condition when the bridge member reaches the end of its downward stroke. On the other hand, the cam of the bridge member is disengaged from the set roller of the subordinate base, allowing the bridge member to automatically move upward under the urging of a spring, and consequently to stop the operation of the recorder, whenever a release button fixed on one end of the subordinate base member is pushed.

3,656,705

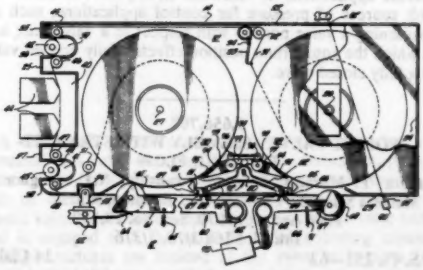
TAPE TRANSPORT ASSEMBLY

George Wesley Boyer, Covina, Calif., assignor to Leach Corporation, Pasadena, Calif.

Filed Dec. 26, 1968, Ser. No. 787,038

Int. Cl. G11b *15/32, 23/04*

U.S. Cl. 242—199 **11 Claims**



The disclosure describes a tape transport assembly that is capable of receiving a plurality of tape cartridges for sequentially operating each cartridge to provide a long period of uninterrupted recording time.

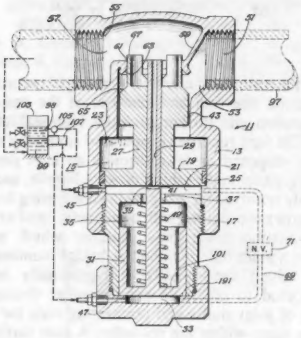
ERRATUM

For Class 244—2 see:
Patent No. 3,656,723

3,656,706
PISTON FOLLOWER DEVICE

Everett E. Johnston, Newark, Tex., assignor to Esco Elevators, Inc., Fort Worth, Tex.

Filed May 21, 1970, Ser. No. 39,460
Int. Cl. F16k *31/143*
U.S. Cl. 251—38 **11 Claims**



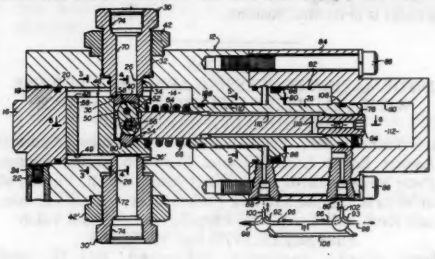
A piston follower device for control applications characterized by a control piston disposed in a control chamber and having a fluid passageway therethrough for communicating outside the control chamber; and a pilot piston disposed in a pilot chamber and having a regulator surface portion that is positionable adjacent the end of the fluid passageway that is in fluid communication with the control chamber to control the size of a fluid outlet. A port is provided in the pilot chamber for connecting the pilot pressure end with a first source of pressure for developing a force to position the pilot piston. A port is provided in the power end of the control chamber that, in co-action with the flow outlet, effects a control pressure for positioning the control piston and opposing the force on the pilot piston. A spring is disposed to act on the pilot piston, tending to force it in one direction or the other toward an equilibrium position. Also disclosed are specific applications in which the fluid ports are connected with sources of pressure for control applications; such as, positioning a valve portion with respect to a valve seat; and in which the equilibrium position effects s fully opened valve or a fully closed valve.

3,656,707
POPPET VALVE ASSEMBLY WITH STRAIGHT-THROUGH FLOW

Patrick T. Marotta, Boonton Township, N.J., assignor to Marotta Scientific Controls, Inc., Boonton, N.J.

Filed Apr. 16, 1970, Ser. No. 29,129
Int. Cl. F16k *3/10, 3/316*
U.S. Cl. 251—62 **14 Claims**

This valve assembly has a housing with aligned inlet and outlet passages, and it has a poppet valve that closes against the upstream pressure with as much force as necessary to seal the pressure of the fluid with which the valve is used. Closing pressure is applied by a mechanical toggle in one embodiment, and pressure on a piston is used in another embodiment. When the valve is open, the poppet is displaced transversely away from the axis of the aligned passages and

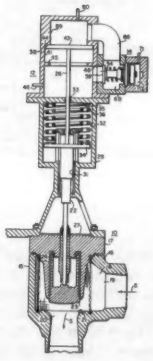


the construction provides straight-through flow with no reduction in the cross section of the flow passage.

3,656,708
DUMP VALVE

Milton M. Hobbs, Springfield, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 10, 1970, Ser. No. 53,965
Int. Cl. F16k *31/143*
U.S. Cl. 251—63.6 **9 Claims**



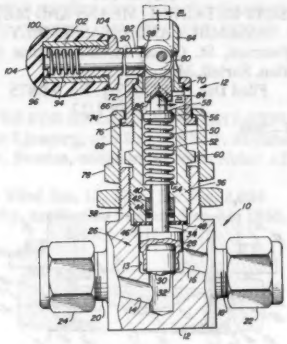
A valve structure for quickly dumping the hydraulic actuating fluid in an actuator system. The structure comprises a valve body having a drainage cavity communicating with an actuating fluid inlet. The inlet is blocked by a valve plug secured to an integral valve stem slidably disposed within the valve body. On the opposite end of the valve stem, a piston member and feedback valve member are secured thereto. The feedback valve member prevents communication between a control fluid cavity in the valve and the drainage cavity. The combination of forces from the control fluid and a spring member seats the valve plug to maintain the actuating fluid pressure and also maintains the feedback valve member in a seated position. Upon decay of the control fluid pressure, the force of the actuating fluid unseats the valve plug, allowing dumping of the actuating fluid, and also unseats the feedback valve member, allowing the control fluid to dump into the drain cavity. The dumping of the control fluid enables the faster dumping of the actuating fluid.

3,656,709

VALVE HAVING IMPROVED CAM-TYPE ACTUATOR

Earl D. Shufflebarger, Mentor; Oliver L. Danko, North Olmsted, and Richard J. Medvick, Cleveland, all of Ohio, assignors to Nupro Company

Filed July 8, 1970, Ser. No. 53,065
Int. Cl. F16k *35/02*
U.S. Cl. 251—95 8 Claims



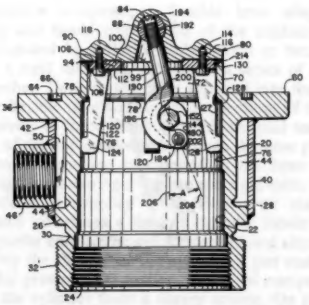
A valve of the type including a body having an internal valve chamber and a valve element mounted therein for reciprocatory movement between at least two positions for controlling flow through the chamber. An operating stem having a free end extending outwardly of the chamber is arranged for moving the valve element. The stem is moved by operating means including a cap means connected to the body and extending over the free end with a cam member mounted in the cap means for rotation about an axis perpendicular to the axis of the stem. An operating shaft extends from the cam member to a position outwardly of the cap means and an operating handle is associated with the shaft for moving it between at least two positions. Additionally, latching means are associated with the handle and the cap means for locking the cam in at least one position.

3,656,710

BOTTOM OPENING VALVE

Harry N. Shaw, Chicago, Ill., assignor to The Golconda Corporation, Chicago, Ill.

Filed July 9, 1970, Ser. No. 53,549
Int. Cl. F16k *1/00, 31/52*
U.S. Cl. 251—144 11 Claims



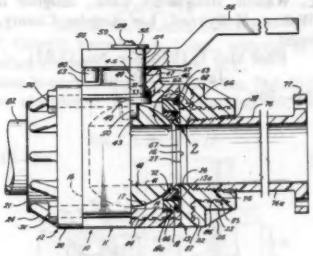
A positive opening and self-closing valve for low pressure fluids having a housing with a valve port around a top opening and spaced from an inner peripheral shoulder. A two-part valve member is used having an upper housing and seat connected to a lower face ring with depending circumferentially spaced radial stop and guide members. The valve member is assembled with the housing above and stop members below the peripheral shoulder with a resilient annular valve seat member retained peripherally between the upper seat and the face ring. The valve is crank-operated for reciprocation from the closed position upwardly to the open position within the limits of the spacing provided by the peripheral shoulder and the radial stop and guide members. The crank shaft for the valve extends through the housing between or adjacent to the stop and guide members and is offset from the vertical axis of the valve member. A connecting rod extends from a wrist pin in the upper housing of the valve member to the crank shaft where it is coupled by means of an arcuate yoke and crank pin to a radial crank member carried by the crank shaft. In the closed position of the valve the arcuate yoke allows the radial crank member to rotate past bottom-dead-center to a locked position and at the same time compressing the resilient valve seat member between the valve seat of the upper housing and the lower face ring and upon the valve port. In the open position of the valve the connecting rod is moved to a vertical position and is stopped by the radial stop members with the radial crank member in an intermediate position (less than top-dead-center) so that the valve is self closing.

3,656,711

THERMOSET PLASTIC BALL VALVE

Lester W. Toelke, Houston, Tex., assignor to Encon Manufacturing Company

Filed Aug. 17, 1970, Ser. No. 64,279
Int. Cl. F16k *51/00*
U.S. Cl. 251—151 12 Claims

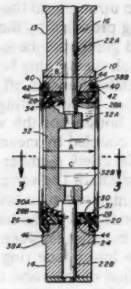


A thermoset, noncircular plastic valve ball is rotatably mounted in a valve chamber formed in a thermoset, ported plastic valve body which is adapted to be secured between a pair of thermoset, ported plastic end caps. A thermoset plastic valve stem extends through the wall of the valve body and is engaged with the valve ball. Self-adjusting annular sealing structures are located at the valve body ports for forming fluid tight seals with the noncircular valve ball. The valve body, end caps, valve ball, and valve stem incorporate a fiber reinforcing. Any amount up to approximately 99 percent of the total number of fibers is greater than one-sixteenth inch in length, but preferably at least the majority of the fibers is greater than one-sixteenth inch in length.

3,656,712
BUTTERFLY VALVE

Bradley E. Bertrem, Tulsa, Okla., assignor to Dover Corporation, Tulsa, Okla.

Filed June 19, 1970, Ser. No. 47,752
Int. Cl. F16k *1/226, 25/00*
U.S. Cl. 251—306 2 Claims

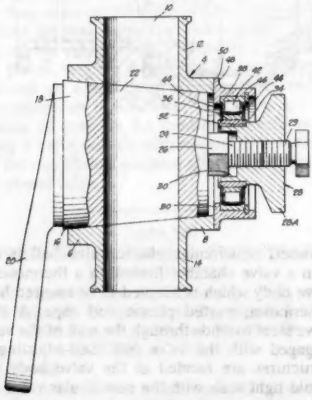


A butterfly valve for mounting between flanges having means facilitating insertion and removal from between flanges and means of retaining fluid pressure when one flange is removed, the valve body having a flow passageway therethrough and a disc rotatable in the flow passageway to close and open the valve, the valve body having opposed paralleled planar faces which are engaged by spaced apart flanges, the valve body having annular grooves in each face and a gasket received in each annular groove, the valve having a resilient liner therein of length equal to or less than the length of the valve body so that no part of the liner extends beyond the valve faces.

3,656,713
FREE TURNING TIE NUT AND PLUG VALVE

Richard C. Walton, Hollywood, Calif., assignor to Annelie Hoyer Walton, Hollywood, Los Angeles County, Calif., a part interest

Filed May 1, 1970, Ser. No. 33,821
Int. Cl. F16k *5/02*
U.S. Cl. 251—309 5 Claims

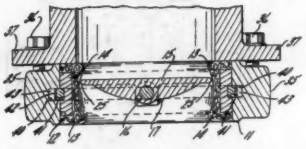


A free turning plug valve and tie nut wherein the plug is retained in the valve housing by a threaded retainer which rotates in an antifriction bearing and the retainer engages an abutment positively limiting the tightening action of the retainer; and wherein the plug or the wall of the housing in which it oscillates has a friction reducing plastic surface, which in cooperation with the controlled tightening means prevents binding of the plug in the housing.

3,656,714
VALVE SEAT RETAINING MEANS AND METHOD OF ASSEMBLY AND DISASSEMBLY

Leslie R. Peterson, St. Cloud, Minn., assignor to De Zurik Corporation, Sartell, Minn.

Filed Dec. 3, 1970, Ser. No. 94,875
Int. Cl. F16k *1/22*
U.S. Cl. 25—360 15 Claims

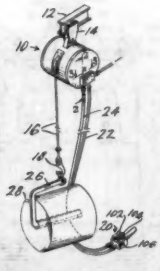


A spring biased valve seat retaining means in the form of an annular sector is inserted wholly within the deeper one of two grooves formed in the inner periphery of the valve body and the outer periphery of the valve seat and snaps into the shallower groove while remaining partially in the deeper groove when the grooves are brought into registry. The shallower groove and the retaining means are formed with cooperatively inclined end portions whereby the retaining means is forced into the deeper groove upon rotation of the seat relative to the body to permit axial removal of the seat from the body.

3,656,715
HOIST HOOK CONTROL

Edgar R. Powell, Grand Haven, Mich., assignor to D. W. Zimmerman Mfg., Inc., Madison Heights, Mich.

Filed May 20, 1969, Ser. No. 826,251
Int. Cl. B66d *1/00*
U.S. Cl. 254—168 10 Claims



A control is provided for maintaining a predetermined position of a hoist hook. The control is designed particularly

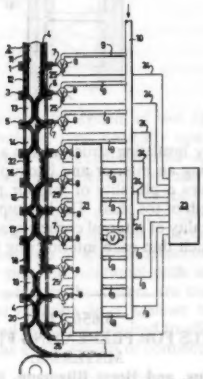
for a pneumatically operated hoist of the type shown in U.S. Pat. No. 3,325,148. In a hoist of that type, when the hoist hook is at rest or inactive in a predetermined position over a period of time, whether or not loaded, the hook will tend to slowly drop as air in the hoist tends to dissipate and the pressure decreases. The new control supplies regulated air to the hoist chamber to maintain a constant pressure therein when the hoist is not being operated, to prevent lowering of the hook. This air is supplied directly to the chamber, by-passing the remotely operated controller used to raise and lower loads.

3,656,716

APPARATUS FOR KNEADING DOUGHY EXPLOSIVES

Sten Herman Ljungerg, and Lennart B. T. Sternhoff, both of Stockholm, Sweden, assignors to Nitro Nobel AB, Gyttorp, Sweden

Filed Jan. 12, 1970, Ser. No. 2,004
Claims priority, application Sweden, Dec. 31, 1968, 18079/68
Int. Cl. B01f *15/02*
U.S. Cl. 259—4 **4 Claims**



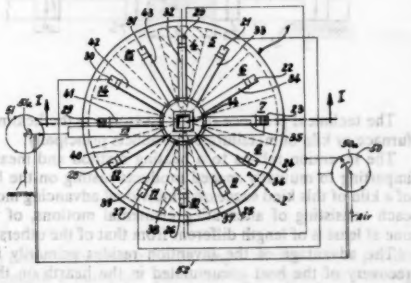
This apparatus comprises a flexible hose adapted to receive solid and liquid constituents of the explosive. This hose is surrounded by a flexible tube which in turn is surrounded by a rigid tube that is made of a series of sections secured together. Compressed air is supplied into the spaces between the flexible tube and successive sections of the rigid tube successively to force the mixture of the solid and liquid constituents of the explosive down through the hose peristalically. The solid ingredient is supplied to the hose from a hopper through a measuring chamber and rigid tube; and the liquid ingredient is supplied from a separate measuring chamber which comprises a flexible cylinder inside a rigid housing. Opposite ends of the cylinder are closed alternately; and alternately the outside of the cylinder is put under suction and under pressure. On suction, the liquid component is sucked into the cylinder from a supply source. On pressure the liquid component is forced out of the cylinder into the hose through a nozzle which surrounds the tube that delivers the solid component into the hose. This nozzle directs the liquid against the inside wall of the hose to prevent the solid ingredient from sticking to the hose.

3,656,717

PROCESS AND APPARATUS FOR THE CONTINUOUS PNEUMATIC TREATMENT OF FINE MATERIAL

Hans Klein, Bergisch Gladbach, and Wolfgang Kluger, Enigerloh, both of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed July 6, 1970, Ser. No. 52,607
Claims priority, application Germany, Aug. 28, 1969, P 19 43 782.2
Int. Cl. B01f *13/02*, *15/02*
U.S. Cl. 259—4 **7 Claims**



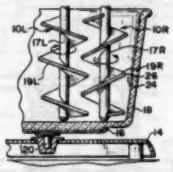
At least two separate zones in the bottom of a mixing chamber are supplied alternately with finely divided streams of agitating air, and fine material to be treated is supplied at alternate points in the top of the chamber, each of such points being located above one of such separate zones. The fine material is withdrawn at the bottom of the chamber. The point at which fine material is supplied is always a point at which the fine material in the chamber is relatively quiet, located above a zone in which the agitation of the material by air is relatively slight.

3,656,718

HELICAL BLADE MIXER

Carmen P. Cairelli, Farmington, Conn., assignor to Dynamics Corporation of America, New York, N.Y.

Continuation-in-part of application Ser. No. 766,402, Oct. 10, 1968, now abandoned. This application July 30, 1970, Ser. No. 59,419
Int. Cl. B01f *9/16*
U.S. Cl. 259—84 **15 Claims**

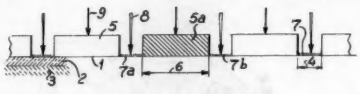


A food mixer having vertically disposed parallel shafts with integral helical intermeshing blades on each shaft rotated in opposite directions for selective use to move the food ingredients vertically upwardly or downwardly in a selectable direction in the mixing zone with or without rotation of a mixing bowl. The relative vertical spacing between the blades at their working overlap is adjustable by varying their relative rotational orientation angle to vary their phase relation therebetween whereby the benefits of a wide spacing and a narrow spacing may be had in the mixing overlap zone.

3,656,719
METHOD OF HEATING METALLURGICAL PRODUCTS

Pierre Marie Louis Dessarts, Paris, France, assignor to Societe Anonyme Heurtey, Paris, France

Filed Aug. 17, 1970, Ser. No. 64,261
Claims priority, application France, Aug. 19, 1969, 6928327
Int. Cl. F27b 9/14
U.S. Cl. 263—6 R 3 Claims



The technical province of this invention is the heating in a furnace or kiln of metallurgical products principally.

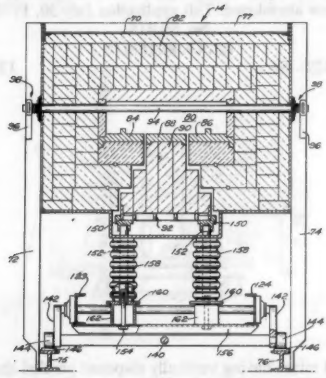
The invention relates to a heating method and means for imparting to mutually spaced products resting on the hearth of a kiln of this kind successive individual advancing motions, each consisting of alternating elemental motions, of which one at least is of length different from that of the others.

The advantage of the invention resides primarily in the recovery of the heat accumulated in the hearth on the uncovered parts thereof and its transmission along successive zones to the undersurfaces of the products being treated, with dwelling times in the kiln and a degree of filling thereof enabling maximum efficiency to be obtained.

3,656,720
HEAT TREATING FURNACE WITH WALKING BEAM DRIVE

Herbert W. Westeren, Barrington; Ernest C. Gronquist, Jr., Providence; Marvin J. Ott, Jr., Warwick, and Donald E. Gunther, Providence, all of R.I., assignors to C. I. Hayes Inc., Cranston, R.I.

Filed Mar. 16, 1970, Ser. No. 19,709
Int. Cl. F27b 9/14
U.S. Cl. 263—6 A 7 Claims

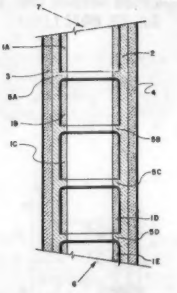


A furnace construction for the heat treating of metal materials and including a conveying apparatus that provides for step-by-step movement of the metal materials through the heat treating chamber of the furnace construction, the drive for the conveying apparatus comprising a walking beam assembly. Sintering of various kinds of materials including metal compacts may be accomplished by the furnace construction and since treatment of the materials at relatively high temperatures is necessary during the heat treating cycle, a special sealing structure is provided for preventing contamination of the high temperature zone during sintering of the materials and the cooling thereof after the sintering cycle.

3,656,721
REFRACTORY STRUCTURE

Jean-Michel Bauer, Chatou, and Andre Brossard, La Garenne-Colombes, both of France, assignors to Societe Generales des Produits Refractaires, Paris, France

Filed July 20, 1970, Ser. No. 56,445
Claims priority, application France, July 18, 1969, 6924459
Int. Cl. F23l 9/04
U.S. Cl. 263—19 R 4 Claims

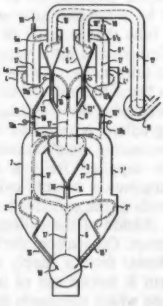


A refractory insulating structure for a hollow combustion shaft comprising an interior and backup lining. The interior lining comprises a plurality of interior ring sections spaced along the length of the shaft. The backup lining is continuous and has a plurality of internal corbels spaced along the length of the shaft such that each interior ring section is supported by a corbel.

3,656,722
APPARATUS FOR PREHEATING FINE GRANULAR MATERIAL

Jochen Polysius, and Horst Ritzmann, both of Neubeckum, Germany, assignors to Polysius AG, Neubeckum, Germany

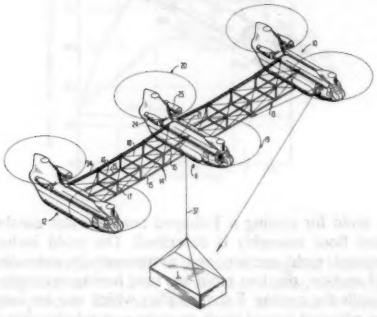
Filed May 28, 1970, Ser. No. 41,286
Claims priority, application Germany, Aug. 12, 1969, P 19 41 071.0
Int. Cl. F27b 15/00; F26b 17/00
U.S. Cl. 263—21 A 4 Claims



A plurality of eddy chambers of the cyclone separator type are arranged in superimposed levels through which the

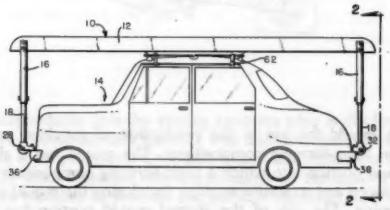
material passes downward in series and through which the hot gases travel upward in series. Each eddy chamber in at least the uppermost level is provided with a dip pipe, and each eddy chamber in at least the lowermost level is constructed without any dip pipe.

3,656,723
MULTIPLE HELICOPTER LIFT SYSTEM
Frank N. Piasecki, Haverford, and Donald N. Meyers, Philadelphia, both of Pa., assignors to Piasecki Aircraft Corporation, Philadelphia, Pa.
Filed Dec. 16, 1969, Ser. No. 885,400
Int. Cl. B64c *37/02*
U.S. Cl. 244—2 **22 Claims**



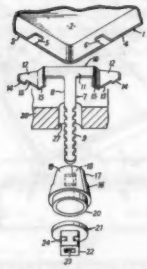
A multiple helicopter lift system of two or more helicopters of the conventional type normally operating independently that are rigidly connected together in a spaced relationship by structural beam members to form an integral unit with the rotor drive systems of the attached helicopters interconnected so that the engines of each of the interconnected helicopters rotate at the same speed, as do the rotors. If desired the flight controls of all helicopters in the system are interconnected so that the rotational path and pitch of the rotors of all helicopters in the system are controlled from a single master pilot's station in a manner to establish the necessary forces and moments required to effectively control the movement of the entire system of connected helicopters.

3,656,724
PAKAHOME
William Greenhalgh, P.O. Box 521, Oshawa, Ontario, Canada
Filed June 5, 1970, Ser. No. 43,722
Int. Cl. B60p *3/34*
U.S. Cl. 296—23 R **5 Claims**



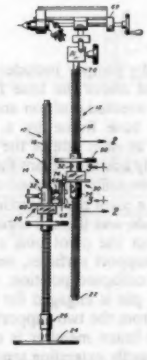
A unit adapted to be carried on top of a vehicle, and which can be opened up upon arrival at a stopping place on a journey, and converted to a full enclosure for the carrying vehicle, or to a safe and private quarters for one or more persons, for sleeping, eating or other activities.

3,656,725
MOUNTING OF GRAMOPHONE UNIT PLATES AND SIMILAR FLANGE-EDGED PANELS
Rene Clark, Woodborough, England, assignor to The Plessey Company Limited, Ilford, England
Filed May 7, 1970, Ser. No. 35,363
Claims priority, application Great Britain, May 23, 1969, 26,435/69
Int. Cl. F16j *15/08*
U.S. Cl. 248—22 **5 Claims**



To detachably secure a mounting stud in a corner position underneath a unit-plate panel having integrally drawn edge flanges, the mounting stud is provided with a T-bar which is placed underneath integral, inwardly bent tabs projecting respectively from two flanges meeting at a corner of the plate with the T-bar extending from flange to flange at 45° to these, touching the flanges at both ends and being held against displacement along the flanges, when the stud is upright, by inter-engagement of portions of the T-bar ends and of the tabs. Preferably the T-bar ends are flat and bent at 45° from the T-bar center part to lie flat on the flanges and have projections which, when the stud is upright and in contact with the panel, project at the two sides of each tab to clamp the unit plate to a mounting board. A rubber buffer having slots to accommodate the T-bar is slid over the stud on one side, and a bush, fitting over the buttress-toothed mounting stud and having slots for the accommodation of a clip engaging the buttress teeth, is placed on the stud on the other side of the mounting board.

3,656,726
WELDING HEAD HANGER
John R. Haynes, 2630 East 15th Place, Tulsa, Okla.
Filed Oct. 10, 1969, Ser. No. 865,368
Int. Cl. B23k *37/02*
U.S. Cl. 248—124 **1 Claim**

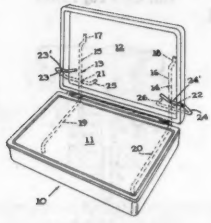


A welding head hanger is vertically and horizontally adjustable to properly align a welding head attached thereon with a work piece to be welded.

3,656,727
HANGER BRACKET MEANS

Hugh T. Greenlee, Cleveland, Ohio, assignor to The Wright Tool and Forge Company, Barberton, Ohio

Filed Aug. 3, 1970, Ser. No. 60,574
Int. Cl. A47f 7/00
U.S. Cl. 248—201 9 Claims

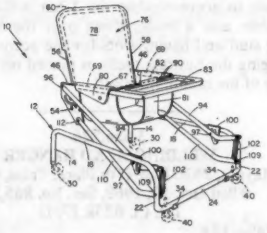


Bracket means for engagement with a perforated "peg board" and capable of supporting a receptacle, such as a tool box or tote box, having a hinged cover or lid, with such cover or lid held in open position.

3,656,728
BABY JUMPER

Clifton A. Griggs, Fitchburg, Mass., assignor to Collier-Keyworth Company, Gardner, Mass.

Filed Aug. 20, 1970, Ser. No. 65,439
Int. Cl. F16m 13/00
U.S. Cl. 248—399 10 Claims

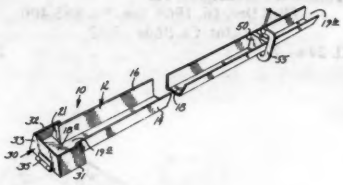


A collapsible baby jumper includes a base frame, and a seat frame disposed above the base frame movable to and from an upright or erected position and a collapsed position, supported on the base frame by a main diagonal brace member, arranged at each side of the seat and base frames, extending diagonally upwardly from the base frame, and having its upper end pivotally connected to the seat frame; each brace member has a pivot pin projecting therefrom at a position between its ends, and there is secured to each side of the base frame adjacent the pivot pins a pivot support means having two pivot support surfaces, one for upright position and the other for collapsed position, with a guide in which the adjacent pivot pin is engaged for controlling movement of the pin to and from the two support surfaces; and the forward end of each brace member is connected to the base frame by a downwardly extending tension spring which in its collapsed position forms a rigid link pivotally connecting the forward end of the brace member to the base frame.

3,656,729
MOLD FOR PREPARING CONCRETE SLOTTED FLOORS

Kenneth J. Borgert, St. Cloud, Minn., assignor to Borget Concrete Products, Inc., St. Joseph, Minn.

Filed Oct. 9, 1970, Ser. No. 79,489
Int. Cl. E04g 11/42
U.S. Cl. 249—18 5 Claims

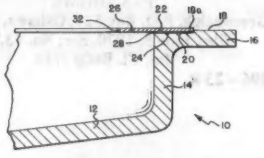


A mold for casting a T-shaped concrete slat useable in a slotted floor assembly is described. The mold includes an elongated mold section and a transversely extending end mold section; the two mold sections having reversely flared sidewalls for casting T-shaped slats which can be assembled in an adjacent lateral trunk-to-cross arm relationship to provide a self-spaced and self-secured slotted floor.

3,656,730
MOULD FOR PRODUCING SHAPED ARTICLES FROM FOAM FORMING COMPOSITIONS

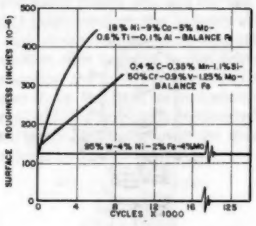
Peter Reginald Hogben, and Eric Short, both of Marley Foam Ltd. Dickley Lane, Lenham, Kent, England

Filed Apr. 23, 1969, Ser. No. 818,650
Claims priority, application Great Britain, May 1, 1968, 20,675/68
Int. Cl. B28b 7/34
U.S. Cl. 249—134 9 Claims



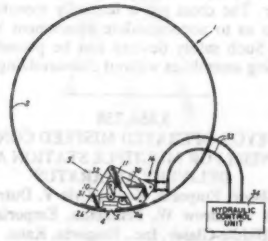
A mould for use in the production of moulded articles from foam-forming compositions. The mould has a shaped mould portion into which a foam-forming composition is introduced and a closure member for closing the mould during foaming. The rim of the shaped mould portion has a lip which extends inwardly beyond the inner surface of the shaped mould portion and which is close to the closure member when the mould is closed. The lip serves to direct the gases escaping from the mould during foaming thereby substantially reducing the formation of a hard edge around the periphery of the moulded article.

3,656,731
TUNGSTEN-NICKEL-IRON-MOLYBDENUM DIE CASTING SHAPING MEMBERS
Earl I. Larsen, 9565 Copley Drive, Indianapolis, Ind.
Continuation-in-part of application Ser. No. 645,041, June 9, 1967, now abandoned , which is a continuation-in-part of application Ser. No. 590,088, Oct. 27, 1966, now abandoned. This application Sept. 5, 1969, Ser. No. 855,701
Int. Cl. B22c 9/06; B22d 17/00
U.S. Cl. 249—135 **18 Claims**


SURFACE ROUGHNESS (INCHES X 10⁻⁶)
CYCLES X 1000
18% Ni-9% Co-5% Mo-0.6% Ti-0.1% Al-BALANCE Fe
0.4% C-0.35% Mn-1.1% Si-50% Cr-0.9% V-1.25% Mo-BALANCE Fe
95% W-4% Ni-2% Fe-4% Mo

This invention is directed to the use of tungsten base alloys containing about 1 to 12 weight percent nickel, about 0.5 to 8 weight percent iron and about 0.5 to about 8 percent molybdenum for die casting dies, molds, cores and other metal shaping members.

3,656,732
EXPANDABLE CORE FOR CASTING CONCRETE PIPE
Dudley St. John, Redlands, Calif., assignor to Hydro Conduit Corporation, Orange, Calif.
Filed Oct. 6, 1970, Ser. No. 78,384
Int. Cl. B28b 7/30
U.S. Cl. 249—179 **16 Claims**

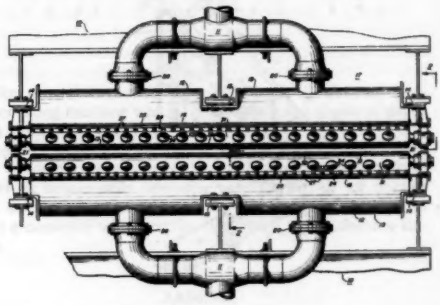


An expandable core for casting concrete pipe is disclosed having a cylindrical core member with a longitudinal slot-like opening in its periphery. Core gate means and rigid links are pivotally interconnected and are mounted on the interior of the core member to straddle the slot-like opening. An overcenter linkage system is connected to the core gate means and driven by fluid or mechanical means to selectively expand the core member, simultaneously pivot the core gate into the slot-like opening and lock the core in this expanded position so that concrete may be cast therearound. To separate the core from concrete cast therearound, the fluid or mechanical means may be selectively operated to drive the overcenter linkage means so as to pivot the core gate means out of the slot-like opening and collapse the core.

ERRATUM

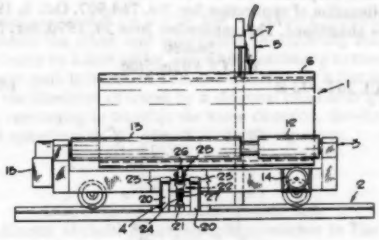
For Class 261—72 R see:
Patent No. 3,656,736

3,656,733
HEAT TREATMENT APPARATUS
Robert L. Winkler, Bethlehem, Pa., and William J. Baker, Valparaiso, Ind., assignors to Bethlehem Steel Corporation
Filed Oct. 30, 1969, Ser. No. 872,676
Int. Cl. C21d 1/62
U.S. Cl. 266—6 S **7 Claims**



Apparatus which is adapted to be removed and replaced as a unit in a quench system for applying quenching fluid at high pressure to a heated workpiece with means to form a continuous uniform curtain of quenching fluid on the workpiece.

3,656,734
PIPE CUTTING DEVICES AND METHODS OF MAKING AND USING THE SAME
William F. Davis, 6234 Langdon Court, Berkeley, Mo.
Filed Oct. 8, 1969, Ser. No. 864,635
Int. Cl. B23k 7/10
U.S. Cl. 266—23 N **4 Claims**



The present invention relates to devices for cutting pipes and similar articles which automatically maintain a uniform longitudinal position between the cutting torch and the arti-

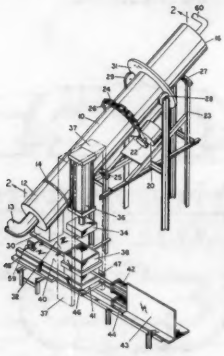
cle to be cut comprising means for detecting longitudinal shift between said torch and the transverse plane of cut of a pipe while it is being cut peripherally and means for minimizing any error or shift.

3,656,735

SCRAP RECLAMATION

Sigdon A. Eliot, Worthington, Ohio, assignor to Thermetics, Inc., Columbus, Ohio

Filed Mar. 3, 1969, Ser. No. 803,729
Int. Cl. F27b 7/14
U.S. Cl. 266—33 S **15 Claims**



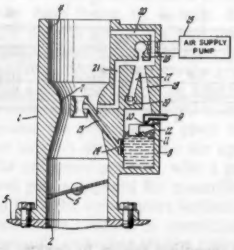
A system for removing oil, water and other adulterants from machine shop scrap cuttings. Scrap is inserted in the upper end of an inclined tumbler barrel and passed through a counterflowing stream of hot gases from a burner located at the lower end. Oxygen is inserted into the tumbler barrel at an intermediate position. The barrel is lined with refractory inserts each having contiguous connecting passages of different diameters. The scrap is raised to a temperature near its melting point and compacted into briquettes while remaining hot. Excess fuel gas flow and combustion prevent the aspiration of air into the barrel and thus prevent oxidation of the metal part of the scrap. As an alternative, the scrap can be melted as it flows from the tumbler barrel directly into a melting pot.

3,656,736

FLUID AMPLIFIER CONTROLLED CARBURETOR

Jerome B. York, Jr., Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of application Ser. No. 764,907, Oct. 3, 1968, now abandoned. This application June 29, 1970, Ser. No. 56,080
Int. Cl. F02m 5/08
U.S. Cl. 261—72 R **1 Claim**



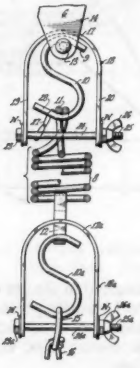
A carburetor with a fluid amplifier, controlled by venturi signal, to pressurize the float bowl in inverse proportion to the air flow through the mixture conduit and thereby augment fuel delivery through the main metering system during engine idling.

3,656,737

SAFETY DEVICES FOR TENSION SPRINGS

Richard D. Smith, 8143 1/2 Winnetka, Canoga Park, Calif., and Ronald S. Du Bois, 790 Spalding, Thousand Oaks, Calif.

Filed Aug. 6, 1970, Ser. No. 61,648
Int. Cl. F16f 1/12
U.S. Cl. 267—73 **5 Claims**



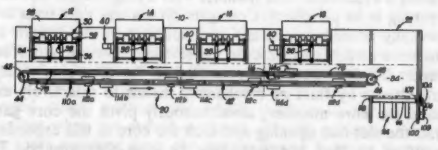
Safety devices for loose attachment to each end of garage-door-mounted coiled tension spring(s) such as used to lift overhead doors. Separated (severed) pieces of spring assembly which result from accidental break and would otherwise fly about the area are retained by the safety device, thus preventing property and personal injury. Different forms of device are provided for attachment to single and to double springs, in either event comprising a rockable cradle or bracket which embraces the spring hanger, plus it journals and anchors a cross pin which traverses the terminal spring attachment loop(s), which loop is also hung on the conventional hanger. The cross pin is limitedly movable axially to the spring so as to accommodate attachment loops of different sizes. Such safety devices can be placed on already mounted spring assemblies without disassembling the latter.

3,656,738

CONVEYOR OPERATED MISFEED CONTROL MECHANISM FOR MULTIPLE STATION ARTICLE DELIVERY APPARATUS

Donald A. Glaser, Emporia, Kans.; Lyle V. Dutro, Pasadena, Calif., and Woodrow W. Pendleton, Emporia, Kans., assignors to Diddle-Glaser, Inc., Emporia, Kans.

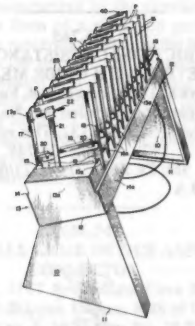
Filed Jan. 22, 1970, Ser. No. 5,033
Int. Cl. B65h 39/02
U.S. Cl. 270—58 **10 Claims**



Control mechanism operated by the conveyor of multiple station article feeding apparatus of the type wherein the

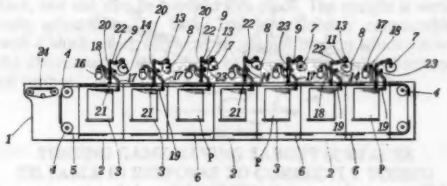
feeder unit at each station has a misfeed detector and in the preferred form all feeder units but the first are provided with article feed deactivating structure. The control mechanism includes a plurality of actuators swingably mounted on the endless roller chain of the conveyor and each normally located in a standby position. A solenoid operated shifter for each feeder unit is coupled to the detector of an associate feeder unit for operation thereby and located adjacent to the chain to shift the actuator next movable theretoward. Sensors proximal to each shifter in the direction of movement of the chain are positioned to be actuated by an actuator in the operated position thereof. All but the last sensor in the line thereof are connected to the deactivating structure of the next following feeder unit to deactivate the latter upon misfeed of a preceding feeder unit and the last sensor is connected to reject mechanism at the delivery end of the conveyor. Reset cam structure returns an operated actuator to the standby position after it passes by the delivery end of the conveyor. Optionally, the control mechanism may be set up to cause articles to be fed from each station down the line from a station at which a misfeed has occurred but operable to actuate the reject mechanism for the group of articles when they reach the end of the conveyor.

3,656,739
COLLATOR
Charles Nicholas Hoff, Willowdale, Ontario, Canada, assignor to General Binding Corporation (Canada) Limited
Filed Aug. 25, 1969, Ser. No. 852,606
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 **12 Claims**



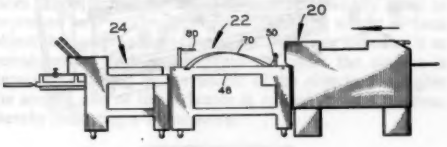
Collating apparatus having a series of trays supported for carrying sheets of paper, and a finger mechanism for pushing individual sheets of paper from the trays upwardly, and anti-friction members arranged on the trays for manually gathering the ejected sheets of paper by a sweeping motion along the upper edges of the trays, the trays being mounted and tilted forwardly towards an operator so as to permit the sheets of paper to be gathered while the operator is seated in front of the machine, and incorporating electrical control means automatically recycling the machine each time the operator gathers the ejected sheets of paper, the machine being so constructed as to permit use of widely different sizes of paper with a minimum of adjustment, the pads of paper in each tray being automatically located due to the forward tilting of the trays.

3,656,740
PAPER PILING MACHINE FOR BINDING
Megumu Takatou, 2-banchi, 1-chome, Jinno-cho, Atsuta-ku, Nagoya, Japan
Filed Oct. 13, 1969, Ser. No. 865,908
Claims priority, application Japan, Oct. 14, 1968, 43/89618
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 **4 Claims**



The present invention disclosed herein is directed to a paper piling machine which collects and piles sheets of paper in a predetermined order. In particular, a machine is disclosed for collecting sheets of paper from different stacks and arranging these sheets into groups of a predetermined order by sequentially operating several pairs of air nozzles and air suction ports in succession to assemble each group onto a conveyor which carries the groups to a collection station.

3,656,741
FOLDING APPARATUS
Thomas F. Macke, 525 S. E. 26th Avenue, Fort Lauderdale, Fla., and Robert W. Olson, 801 S. E. 7th Avenue, Pompano Beach, Fla.
Filed Apr. 3, 1970, Ser. No. 25,522
Int. Cl. B65l *45/22*
U.S. Cl. 270—66 **10 Claims**

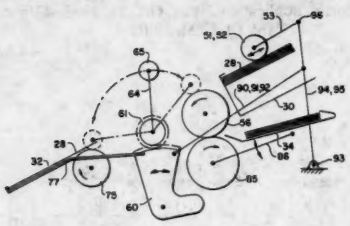


Folding apparatus for use in folding a sheet, particularly for folding the sheet into a signature. A travelling sheet is folded once by a first folder, and while continuing to travel in a straight path is folded in a second folder along a line parallel to the direction of travel by a diagonal cross over guide. While continuing to travel in the same direction, the sheet is folded again by a third folder to produce a signature.

3,656,742
DOCUMENT TRANSPORT DEVICE
Heinz-Gunter Michels, Berlin, Germany, assignor to The National Cash Register Company, Dayton, Ohio
Filed July 29, 1970, Ser. No. 59,090
Claims priority, application Germany, Aug. 1, 1969, P 19 39 129.8
Int. Cl. B65h *5/06*
U.S. Cl. 271—3 **14 Claims**

A single, double-function, pressure platen, movable by actuating mechanism from a home position to two different

operative positions for transporting record material in successive fashion. The platen is positioned to cooperate with a first, constantly driven, platen to transport the record material from a stack to a processing station and then to cooperate with a second, constantly driven, platen to transport the material from the processing station to a collection station.

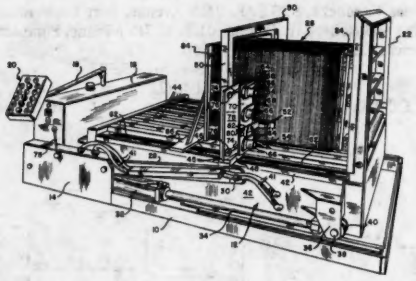


3,656,743

METHOD AND APPARATUS FOR RESTACKING STACKS OF PAPER, CARDBOARD AND THE LIKE SHEETS

Gunnar Ruud, Guru Popp A/S, P.O. Box 50, 1701, Sarpsborg, Norway

Filed Oct. 16, 1970, Ser. No. 81,444
Int. Cl. B65h *31/40*
U.S. Cl. 271—61 **12 Claims**



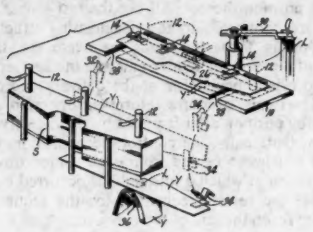
A machine for processing and restacking stacks of sheets of printed or unprinted paper, cardboard and the like, including a support, means for holding the sheets of a stack on edge, in a substantially vertical position on the support, sheet lifting means movable along the support successively under the sheets of the stack, side sheet guide means having a face located adjacent the position of the side edges of the sheets of the stack above the support with its face in a position to be engaged by the adjacent side edges of the sheets, means for vibrating the sheet lifting means for in turn vibrating, loosening and separating the sheets of the stack at the position of the sheet lifting means, means for positioning the vibrating means and controlling its effect on the lifted sheets for moving them in a direction to cause their said side edges to contact the face of the side guide means, thereby stacking the sheets of the stack with the side edges in alignment. The support of this unit comprises a plurality of spaced parallel beams, the sheet lifting means and the vibrating means comprises a plurality of lifting shoes located between beams and projecting above their upper surfaces, and the vibrating means is an electromagnetic vibrator for controlling the stacking of the sheets.

3,656,744

SHEET REGISTERING MECHANISM

Richard W. Gray, 24 Lee Street, Apt. B-8, Marblehead, Mass.; Paul E. Morgan, 109 Highview Avenue, Melrose, Mass., and Paul G. Rumball, 8 Laurel Street, Beverly, Mass., assignors to USM Corporation, Boston, Mass.

Filed Mar. 13, 1970, Ser. No. 19,256
Int. Cl. B65n *9/04*
U.S. Cl. 271—60 **2 Claims**



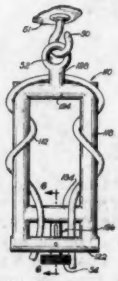
A device is disclosed employing no moving parts for quietly causing sheets of flexible material, especially fabric work pieces, to assume a desired position in a plane. A pair of adjustably mounted U-shaped edge gages respectively including an air flow device for directly air parallel to and along a surface of the work piece within the edge gage, has closed ends of the gages cooperating to determine selectively the position of the margin of the flexible material. The device has particular advantage when used in conjunction with an automatic fabric feeder, for example.

3,656,745

PULL-TYPE FRICTIONAL RESISTANCE EXERCISING DEVICE WITH GUIDE MEANS

Edgar E. Holkesvick, 1801 Smokewood, Fullerton, Calif.

Continuation-in-part of application Ser. No. 693,206, Dec. 26, 1967, now Patent No. 3,510,132. This application May 5, 1970, Ser. No. 34,745
Int. Cl. A63b *21/00, 23/04*
U.S. Cl. 272—79 A **12 Claims**



An exercising device for use with a length of rope and adapted to have one end thereof fastened to a support while the length of rope is pulled back and forth therethrough. The exercising device includes two elongated leg members to receive turns of rope therearound, a neck-like guide portion between the leg members for guiding the rope from one leg

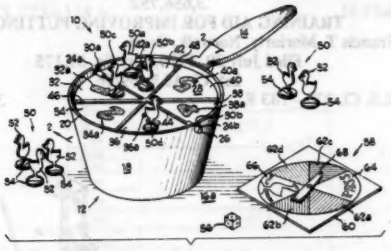
member to the other leg member, a retaining bar adjacent the other ends of the leg members to prevent the turns of rope from slipping off the device, and an attachment member on the end of the guide member for supporting the device. A member is also provided adjacent the other end for preventing the portions of rope from becoming entangled.

3,656,746

BALANCING GAME WITH PIVOTED RECEPTACLE COVER MEMBER

Jeffrey D. Breslow, Chicago, Ill., assignor to Marvin Glass & Associates

Filed Mar. 2, 1970, Ser. No. 15,623
Int. Cl. A63f 9/00
U.S. Cl. 273—1 R **2 Claims**



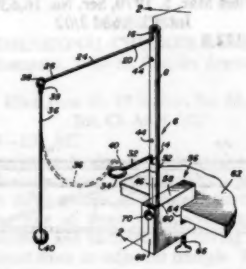
A game of the type wherein playing pieces are deposited on a surface according to the dictates of a chance device until an excessive number of playing pieces are deposited thereupon, resulting in a dumping or tilting action of the playing surface, characterized by the provision of a supporting member in the form of a simulated pot-like receptacle and a playing piece receiving surface in the form of a lid-like member pivoted to the open end of the receptacle, with the receiving surface divided into discrete zones, and a plurality of visually identifiable playing pieces for depositing on the zones of the playing surface. Chance devices are provided for determining which zone is to receive a playing piece and for further determining which type of playing piece is to be deposited in the determined zone.

3,656,747

TETHERED BALL GAME DEVICE AND SURFACE CONNECTOR

Don H. Revell, Jr., 3107 Brownhurst Cove Road, and Hans W. Copony, 2733 Shippen Avenue, both of Louisville, Ky.

Filed Apr. 8, 1970, Ser. No. 26,711
Int. Cl. A63f 7/00
U.S. Cl. 273—95 A **3 Claims**



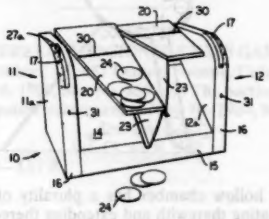
A tethered projectile, usually a ball, is tossed by hand in a manner to score when properly landed and retained on a captive-type target, a seating ring for example. An upright is provided at its lower end with an adapter bracket capable of being clamped on a stationary support member and has an arm suspending a projectile-tethering-string. The upright comprises separably connectable dowel-like sections. The arm and also the target means are detachably connected to an upper one of the aforementioned sections. The game device is of such construction that it may be located on a vertical support surface as well as on a horizontal support surface, and can also be screwed into place. The upright is vertically adjustable. The lower end is detachably connectable with a block which serves as an adapter bracket which allows the above-mentioned support by either a vertical or horizontal surface.

3,656,748

TOSSING GAME HAVING TARGET SURFACES TILTABLE IN RESPONSE TO CORRECTLY TOSSED PROJECTILE

Arthur G. Howard, 5869 N. Keystone Avenue, Indianapolis, Ind.

Filed Dec. 1, 1969, Ser. No. 881,193
Int. Cl. A63b 63/00
U.S. Cl. 273—102.1 F **6 Claims**



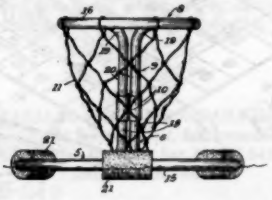
A game for persons of any age or either sex wherein a plurality of weighted objects are successively tossed from a set distance towards a selected one of two tiltable playing surfaces. Each of the playing surfaces is downwardly tilted or depressed to a predetermined extent by the weight of each object that comes to rest thereupon. A scoring indicator is so connected to each surface that the more the surface is depressed or tilted by the weight of the objects, the higher the scoring end of the indicator is rocked about a fulcrum, thereby indicating a higher score.

3,656,749

BUOYANT GAME HOOP

Gilbert Reyes, El Monte, Calif., assignor to Albert J. Jacobs, Van Nuys, Calif., a part interest

Filed Jan. 28, 1970, Ser. No. 6,418
Int. Cl. A63b 63/00
U.S. Cl. 273—105 R **7 Claims**



A game device formed of a flat, circular, plastics base member provided with buoyancy elements, a smaller, flat,

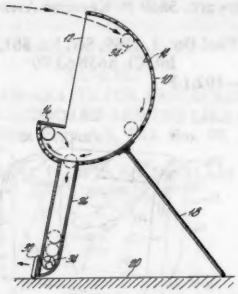
circular, plastics hoop member from which a ball-passing net is adapted to be hung, an integral portion being provided on each member and extending from the plane of each respective member, and sleeve means connecting the ends of the extending portions to space the hoop member above the base member. The apparatus is used in swimming pools for playing games similar to basketball and, in some respects, similar to water polo.

3,656,750

BALL TARGET COMPRISING A HOLLOW SPHERICAL CHAMBER AND TUBES EXTENDING THEREFROM

Albert E. Meunier, Pawtucket, R.I., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 24, 1970, Ser. No. 48,976
Int. Cl. A63b *63/00*
U.S. Cl. 273—105 R 2 Claims



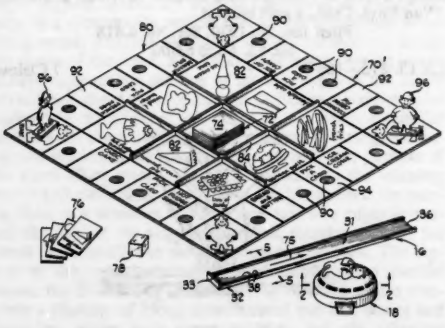
A large hollow chamber has a plurality of hollow tubes communicating therewith and extending thereout. Each tube represents a different base ball condition such as strike, out, or a hit for one or more bases. Two players take turns throwing a ball into the chamber whereby the ball falls into one or another of the tubes.

3,656,751

BOARD GAME APPARATUS

Marvin I. Glass; Jeffrey D. Breslow, both of Chicago, and Gunars Licitis, Lombard, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 9, 1969, Ser. No. 790,002
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 B 1 Claim



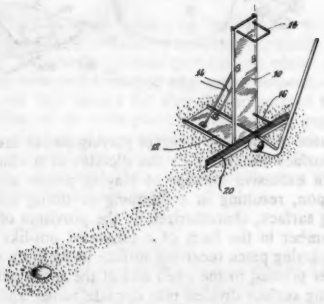
Game apparatus including a game board having a path for movement of markers in accordance with numbers with selected by means of a die, certain of the stations along the path being distinctly marked to indicate that the player should also use a second chance means to instruct him as to further play, and said board having areas thereof provided with pictorial representations. The players are provided with game pieces in the form of illustrated cards, each being identifiable with one of said pictorial representations, and the disposition of such cards is determined by instructions provided on sound reproducing means providing the second chance means. The sound reproducing means comprises an elongated strip having a plurality of parallel sound tracks with different messages, and a diaphragm and stylus device is manually moved along a sound track at random to effect reproduction of a message of instruction in the play of the illustrated cards.

3,656,752

TRAINING AID FOR IMPROVING PUTTING

Francis T. Moriarty, Norwalk, Conn.

Filed July 29, 1970, Ser. No. 59,175
Int. Cl. A63b *69/36*
U.S. Cl. 273—183 E 3 Claims



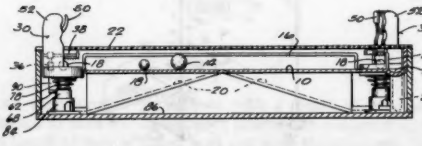
A training aid for putting comprises a base adapted to assume the slope of the surface on which it is placed and a standard normal to the base and providing a line of ball travel sighting aid and a plurality of eye positioning sighting members spaced apart one above the other and projecting in the same direction from the standard and disposed so that there is room for a putter head to move under the lower sighting member along a line parallel with the line of ball travel sighting aid.

3,656,753

MINIATURE BALL GAME

Raymond L. Juneau, 3307 W. Wells Street, Milwaukee, Wis.

Filed Mar. 5, 1970, Ser. No. 16,639
Int. Cl. A63d *3/02*
U.S. Cl. 273—122 R 8 Claims



A game having a playing surface with opposite goals into which a ball is to be driven by opposed players or teams is

surrounded by a barrier above the level of the playing surface which confines the playing ball to the surface. A transparent cover may be used above the barrier. Each side is provided with turrets which shoot marbles or the like along the playing surface to drive the playing ball into a goal. The marbles pass under the barrier and are returned to the turrets for re-use. A number of forms of turret are disclosed, each being rotatable and capable of automatic re-supply of marbles from the return channels.

3,656,754

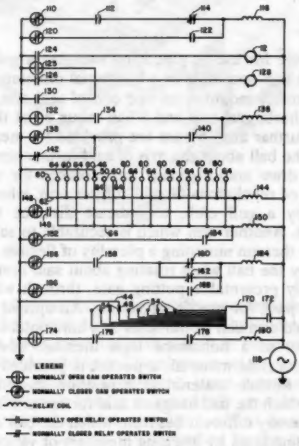
RANDOM SELECTION AND REGISTRATION APPARATUS

Norman R. Clark, Oak Lawn, Ill., assignor to Walter E. Heller & Company, Chicago, Ill.

Filed June 8, 1970, Ser. No. 44,455

Int. Cl. A63b *71/06*; A63f *7/00*

U.S. Cl. 273—124 A **16 Claims**



A motor actuated spinning indicator coasts to a stop after deactuation to make a random selection. Information regarding the selection is then transmitted to an appropriate register, transmission of the information being precluded until the indicator has stopped. Such an arrangement has particular applicability in a game scoring situation.

3,656,755

THREE-DIMENSIONAL CHECKER GAME APPARATUS

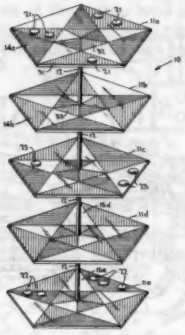
Robert I. Thompson, 7444 St. Charles Avenue, New Orleans, La.

Filed June 26, 1970, Ser. No. 50,262

Int. Cl. A63f *3/02*

U.S. Cl. 273—131 AC **5 Claims**

A checker game having five identical vertically spaced game boards each shaped in the form of a pentagon which is divided into three groups of different sized triangles, each group having one of three visual characteristics different from one another and each triangle having a visual characteristic different from an adjacent triangle. The game boards are oriented in a manner whereby no more than two triangles on one board are coaxial with triangles on an adjacent board having the same visual characteristic. Play is conducted with three sets of pieces having visual characteristics corresponding to those of said groups, the pieces being initially placed



on their corresponding triangles on the topmost, bottommost and middle game boards.

3,656,756

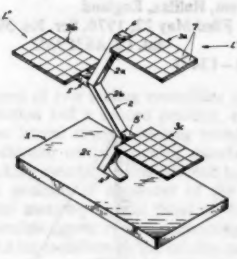
THREE-DIMENSIONAL CHESS GAME

Edwin F. Gribbon, Jr., 457 Central Avenue, Cedarhurst, N.Y.

Filed Sept. 18, 1969, Ser. No. 859,023. The portion of the term of the patent subsequent to Nov. 10, 1984, has been disclaimed.

Int. Cl. A63f *3/02*

U.S. Cl. 273—131 B **7 Claims**



Two sets of conventional chess men (eight pawns and eight pieces per side) confront each other on three vertically spaced boards of four by six squares each, with the middle board offset from the substantially aligned top and bottom boards to provide three freely accessible playing surfaces on which the men may move longitudinally, laterally or vertically (from one board to another) according to predetermined rules.

3,656,757

FARM BOARD GAME APPARATUS

James F. Carroll, 501 Estelle Street, Blackwood, N.J.

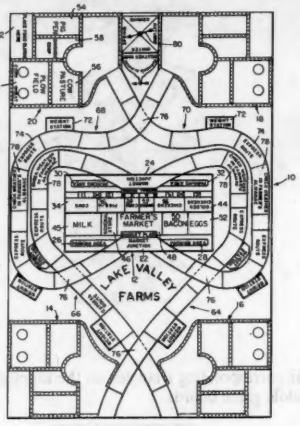
Filed Mar. 30, 1970, Ser. No. 23,541

Int. Cl. A63f *3/02*

U.S. Cl. 273—134 D **8 Claims**

A game apparatus comprising a board having thereon indicia representing farms, a market, and roads therebetween, said roads crossing to provide collision points and being pro-

vided with obstacles, a plurality of movable pieces representing farm animals and products, and a plurality of movable miniature truck pieces each having capacity for receiving and



transporting a plurality of said first mentioned movable pieces, said truck pieces being movable over said roads between said farms and said market.

3,656,758

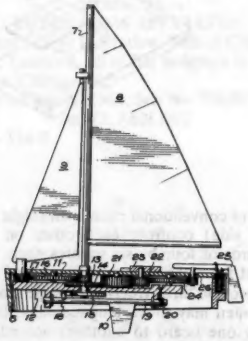
GAME APPARATUS

Irvine L. Thatcher, Greenleaves, Marldon Road, Northowram, Halifax, England

Filed May 22, 1970, Ser. No. 39,607

Int. Cl. A63f 3/02

U.S. Cl. 273—134 G **1 Claim**



Sailing game apparatus comprising a board which portrays a waterway, model boats, each having a rotatable mast, a sail connected to said mast, a simulated wind direction indicator, a rotatable keel plate, and a gear system for adjusting said indicator and said plate in response to rotation of said mast. The board is provided with a network of horizontal, vertical and diagonal grooves, each comprising three subgrooves for receiving said keel plate in vertical or inclined position.

3,656,759

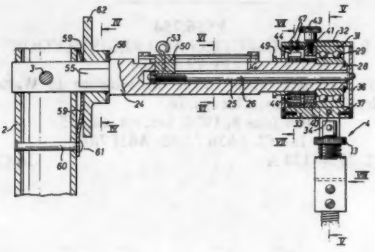
DEVICE FOR USE IN PRACTICING SWINGING A GOLF CLUB

Richmond L. Hall, 2 Langley Road, Highcliffe-on-Sea, Hampshire, England

Filed Apr. 14, 1970, Ser. No. 28,347

Int. Cl. A63b 69/36

U.S. Cl. 273—185 D **12 Claims**



A device for use in practicing swinging a golf club comprises an arm securable in a horizontal orientation, a further arm rotatably mounted on one end of said arm for rotation about a horizontal axis and a ball mounted at the outer end of said further arm. Means are provided for measuring rotation of the ball about the axis of said further arm to indicate fade or draw and/or means are provided for counting the number of revolutions of said further arm, when the ball is struck by a golf club, to indicate distance the ball has travelled. Another arm which is securable to said arm has a member thereon mounting a plurality of flexible fingers to be struck by the ball when rotating about said arm and also an optionally presentable putting gate, through which the ball can just pass, for practicing putting. An upright member, on which said arm can be mounted in a horizontal orientation, is supported in a horizontal base member covered with a resilient flexible material, a pocket is provided beneath the resilient flexible material at a position immediately below that at which the ball hangs on said further arm in a rest position, whereby different lies from which the ball can be struck can be simulated by inserting members of various consistencies in said pocket.

3,656,760

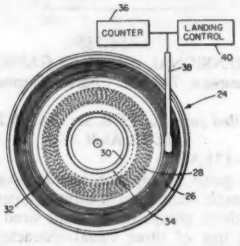
METHODS AND MEANS FOR INDUCING HYPNOSIS

Paul S. Symmes, Cornwall Heights, Pa., assignor to American Clinic, Inc., Seattle, Wash.

Filed Aug. 7, 1969, Ser. No. 848,173

Int. Cl. G11b 3/00

U.S. Cl. 274—1 R **5 Claims**



An arrangement for inducing hypnosis includes a record medium subdivided into sections. A first section reproduces a

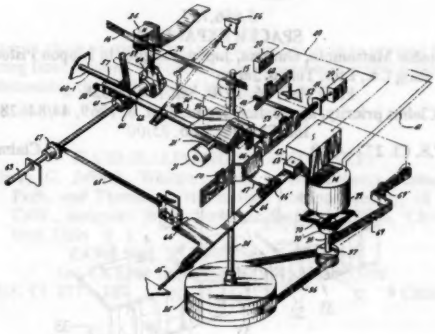
message once for a predetermined period of time. A second section reproduces a second message repetitively for an indefinite period of time. A third section may be included to produce a message or alarm ending the period of hypnosis. Alternately, the alarm may be outside of the record medium.

3,656,761

AUTOMATIC CONTROLS FOR TAPE PLAYERS OF CARTRIDGE TYPE

Joseph E. Laschenski, Philadelphia, Pa., assignor to Philco Corporation, Philadelphia, Pa.

Filed June 20, 1966, Ser. No. 558,730
Int. Cl. G11b *21/08, 15/29*
U.S. Cl. 274—4 G **1 Claim**



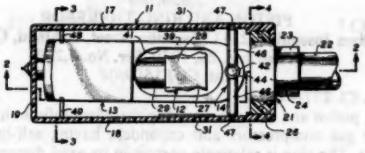
An apparatus adapted for automatically accommodating for play either a four track cartridge without a built-in pinch roller or an eight track cartridge with a built-in pinch roller upon insertion of said cartridges. The player is set to play the eight track cartridge without adjustment. Upon insertion of the four track cartridges a linkage automatically provides for shifting of the head adjustment cam from a first location providing a series of positions corresponding to the track tape to a second location providing a series of positions corresponding to the track levels of the four track tape and for moving a pinch roller from a storage position into an operative position within the four track tape cartridge.

3,656,762

PHONOGRAPH PICKUP HEAD ASSEMBLY

Richard D. Johnson, Rosemead, Calif., assignor to Reverbasonics, Inc., Oakland, Calif.

Filed Jan. 7, 1970, Ser. No. 1,232
Int. Cl. G11b *3/02*
U.S. Cl. 274—37 **3 Claims**



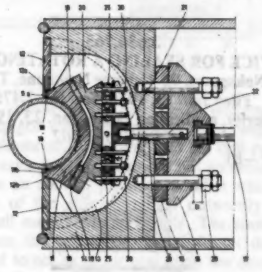
A phonograph pickup head assembly is described for producing reverberative sound signals from a grooved phonograph disc. The head assembly includes a pickup head and forward and rear cartridge supports. The rear cartridge support is secured rigidly to the pickup head and the forward cartridge support is secured such that it is movable laterally and vertically with respect thereto. A mounting clamp is provided at the rearward end of the pickup head for attaching the pickup head to a tone arm in a manner in which the relative angular position of the pickup head with respect to the tone arm is adjustable.

3,656,763

SEALING PACKER

Philippe Joubert, Rungis, and Andre Castela, Mesnil Le Roi, both of France, assignors to Institut Francais Du Petrole, Des Carburants Et Lubrifiants, Rueil Malmaison (Hauts de Seine), France

Filed July 2, 1970, Ser. No. 51,955
Claims priority, application France, July 7, 1969, 6923038
Int. Cl. F16j *15/00*
U.S. Cl. 277—63 **9 Claims**



Sealing packer formed of two sealing assemblies movable between a joining position and a spaced position, each assembly comprising two lateral straight packing members on both sides of a semi-circular central packing member, said lateral and central packing members being adapted to be displaced together to a position of abutment of the lateral packing members of an assembly against those of the other assembly, first compressible elastic means connecting a support of said lateral packing members to the driving means of said central packing members, to provide for the relative displacement of the central packing member with respect to the lateral packing members, and second compressible elastic means interposed between said central packing member and said driving means, to provide a compression stress on said central packing members in their joining position.

3,656,764

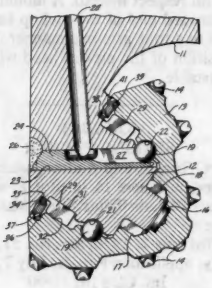
DRILL BIT SEAL ASSEMBLY

William P. Robinson, 6100 Via Subida, Miraleste, Calif.

Filed Aug. 31, 1970, Ser. No. 68,140
Int. Cl. F16j *15/16*
U.S. Cl. 277—92 **14 Claims**

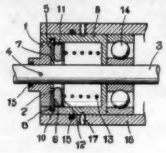
An earth boring drill bit employing roller cutters is provided with an improved seal for inhibiting ingress of abrasive materials into the bearing surfaces and egress of lubricant. The improved seal is between an outwardly facing re-entrant corner on the journal and an inwardly facing re-entrant corner on the cutter. The seal is made by a pair of O-rings engaging the opposed re-entrant corners and separated by a floating rigid ring having opposed bearing surfaces for seating the O-rings into the corners. This seal accommodates radial,

axial, and angular displacements of almost twice the magnitude that can be accommodated by a single O-ring of the



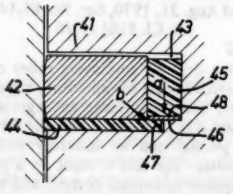
size of one of the O-rings without significantly increasing the length of journal needed for the seal.

3,656,765
A DEVICE FOR SEALING A ROTATING SHAFT
Kennosuke Nakagawa, 95-1 chome Naumune, Tokyo, Japan
Filed Jan. 13, 1970, Ser. No. 2,475
Claims priority, application Japan, Jan. 23, 1969, 44/4449
Int. Cl. F16j 15/02
U.S. Cl. 277—81 **8 Claims**



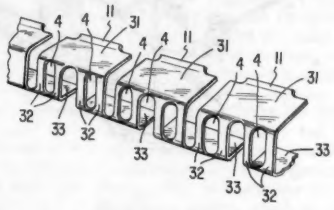
A device for sealing a rotating shaft under wide pressure ranges from extremely high vacuum up to extremely high pressure, in which a contact surface is formed between a sealing seat of washer configuration and the end of a rotating ring fixed to the rotating shaft, or the end of a fixed ring fixed to a gland. An O-ring and spring-holding washer are installed at the back side of the sealing seat and they are pressed by a spring, or liquid pressure so that the O-ring is pressed against the sealing seat.

3,656,766
PISTON AND PISTON RINGS UNIT FOR AN INTERNAL COMBUSTION ENGINE
Robert Geffroy, 1, boulevard Richard Wallace, Neuilly-sur-Seine, France
Filed Dec. 15, 1969, Ser. No. 885,245
Int. Cl. F16j 9/12
U.S. Cl. 277—136 **34 Claims**



The invention has for its object, on the one hand, all means which protect, at least partially, the internal face of the sealing joint placed between the lower adjacent faces of the piston ring and the piston groove against the high pressures which, from the combustion chamber pass between the compression ring and the bottom of the groove and also into the cross-sectional or gap clearance of the compression ring, and on the other hand, a support for the said joint, which is not affected by creep, is annular, is not fixed to the piston and is arranged at least under the periphery of the said joint between the joint and the lower face of the piston groove, the peripheral face of the support being maintained at least in proximity to the cylinder and having as a maximum narrow discontinuities, the maximum clearances of this proximity and of these discontinuities being smaller than those in which the material of the said joint begins to creep, under the conditions of temperatures and pressures reached during the operation of the engine.

3,656,767
SPACER EXPANDER
Yoshio Matsumoto, Gumma, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan
Filed Mar. 16, 1970, Ser. No. 19,828
Claims priority, application Japan, Sept. 6, 1969, 44/84628
Int. Cl. F16j 9/06, 15/00
U.S. Cl. 277—140 **2 Claims**

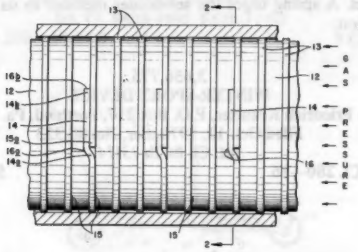


A spacer expander for an internal combustion engine piston ring assembly has a plurality of T-shaped cut-out portions alternating from both side edges so that remaining edge portion forms a plurality of projections between the cut-out portions. Upper pressure areas, vertical outside areas and lower pressure areas, with a plurality of oil passages formed on the outside areas, are formed between the cut-out portions. The projections are curved outwardly at right angles. The upper and lower pressure areas are curved with respect to the vertical outside areas and at right angle to the same sides. The spacer expander is inserted into the piston groove by bending it into circular shape so that the projection side lies to the inside of the groove in such a manner that side rails inserted into the piston groove are mounted on the spacer expander at their projections so that the projections push the side rails in the outward direction in order for the outer peripheral surface of the side rails to slidably contact with the cylinder wall.

3,656,768
PISTON AND RING THEREFOR
William Josephian, 2311 Magonlia Street, Oakland, Calif.
Filed Jan. 20, 1970, Ser. No. 4,230
Int. Cl. F16j 9/04
U.S. Cl. 277—167 **5 Claims**

A piston and compression ring therefor useful in high pressure gas compressors and expanders having self-lubricated rings. The ring is relatively narrow in its axial dimension and has an angular length from end to end thereof in excess of 360°, one end portion of the ring being offset axially so as to overlap the other end portion thereof and reinforce the same. The piston provides a circumferential ring groove that is enlarged axially over an angular length sufficient to seat such

offset overlapping end portion of the ring therein; and the ends of the groove as defined by the axial enlargement thereof and the respectively cooperative portions of the ring

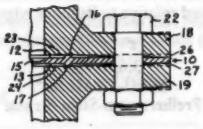


are in close proximity and are all parallel so as to prevent the ring from rotating but permit it to expand as it wears without increasing the likelihood of leakage therepast.

3,656,769
FLUID SEALING JOINT AND GASKET

Jerry G. Jelinek, Whittier; Gary L. Duesenberry, Canoga Park, and Thomas J. McCuistion, Marina Del Rey, all of Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Sept. 30, 1968, Ser. No. 763,647
Int. Cl. F16l *19/00;* **F16j** *15/00;* **B65d** *53/00*
U.S. Cl. 277—207 **9 Claims**

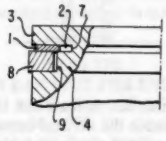


A sealed joint between a pair of members in which one member has a raised rib for sealing contacting the other member at one location and has a predetermined clearance with the other member at another location, one of the members being yieldable under clamping pressure to take up the clearance upon application of predetermined pressure upon the rib. The invention also provides means for achieving substantially equal unit sealing pressure throughout the length of the rib despite uneven yielding of the one member.

3,656,770
PISTON

Heinrich Hoffmann, Stuttgart-Geroksruhe, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Jan. 23, 1970, Ser. No. 5,286
Claims priority, application Germany, Jan. 23, 1969, P 19 03 257.6
Int. Cl. F16j *9/22, 9/00*
U.S. Cl. 277—189.5 **7 Claims**

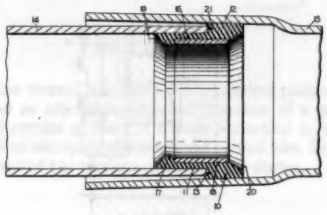


A piston in which the piston ring arranged in the groove following the piston top land is securely supported by a piston ring support that consists of an annular disc retained under stress with its inner circumference at the piston, and more particularly between the upper edge of the piston ring groove and the piston ring itself.

3,656,771
FLEXIBLE SEAL ASSEMBLY FOR SPIGOT AND BELL CONDUIT JOINT

John C. Stout, Portland, Oreg., assignor to Irrigation Accessories Co., Portland, Oreg.

Filed Dec. 11, 1970, Ser. No. 97,158
Int. Cl. F16j *15/02*
U.S. Cl. 277—207 A **6 Claims**

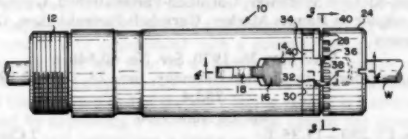


A resilient sealing sleeve has one portion inserted in the end of the spigot member and the remaining portion, of larger outer diameter, extending into the bell portion of the joint. The interior wall of the sleeve has an annular recess to accommodate an annular pressure member which keeps the two portions of the sleeve pressed outwardly against the spigot and bell members respectively. The shoulder on the sleeve between the smaller and larger outer diameter portions is slotted to act as an air seal upon the development of vacuum within the conduit.

3,656,772
FEED CHUCKS

Hubert J. Parsons, Horseheads, and Anders Adolf Peterson, Elmira, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

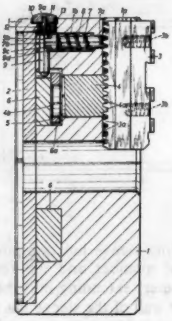
Filed Aug. 3, 1970, Ser. No. 60,352
Int. Cl. B23b *31/00*
U.S. Cl. 279—23 **16 Claims**



A feed chuck for a machine tool including a tubular body member, a plurality of radially spaced, longitudinally extending slots in said body member, spring means in each of the slots each having one end fixed in an end of its slot and having its middle portion bowed inwardly of the body member for engagement with bar stock, movable spring compression adjusting means engaging the body member and engaging the other ends of the spring means for further inwardly bowing each of the spring means to various positions for adjusting the gripping force on the bar stock inserted into the chuck, a plurality of notches formed in the movable spring compression adjusting means, lock means secured to the body member and engaging at least one of the notches for preventing relative rotation of the body member and the movable spring compression adjusting means, and the lock means having a substantial portion outwardly of the surface of the

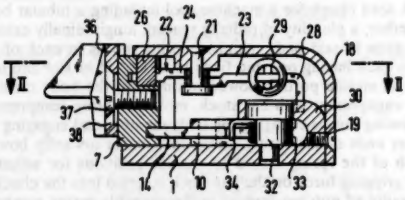
bowed middle portion of the spring means and between the ends of the spring means.

3,656,773
CHUCK FOR TURNING MACHINES
Hans Blattry, and Wolfgang Kimm, both of Buderich, Germany, assignors to Paul Forkardt Kommanditgesellschaft, Dusseldorf, Germany
Filed July 1, 1970, Ser. No. 51,440
Claims priority, application Germany, Feb. 4, 1970, P 20 04 889.9
Int. Cl. B23b 31/16
U.S. Cl. 279—121 7 Claims



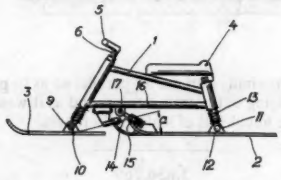
The specification discloses a chuck for a machine tool having radially movable jaws for engaging a workpiece. A rotatable drive member in the chuck body engages the jaws and is movable between certain limits to actuate the jaws positively in radial movement on the chuck body. Movement of the drive member beyond one of its limits releases the jaws from the drive member and simultaneously releases holding pins which engage the jaws. Each holding pin is manually movable into jaw disengaging position to permit the jaws to be removed from or introduced into the chuck body, or to be radially adjusted on the chuck body.

3,656,774
TOE IRON FOR SAFETY SKI BINDINGS
Ernst-Richard Schriewer, Garmisch-Partenkirchen, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany
Filed May 26, 1970, Ser. No. 40,546
Claims priority, application Germany, June 23, 1969, P 19 31 753.4
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T 7 Claims



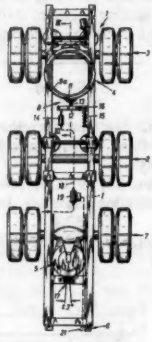
A soleholder member constituting a coupling link of a four-bar linkage, which comprises levers that are pivoted to a baseplate which is secured to the ski. The four-bar linkage is modified in that the levers consist of toggle joints, which have toggle arms that are pivoted to the baseplate and the arms in the normal position of the toe iron diverge and engage stationary stops, whereas the other toggle arms of the toggle joints in the position of the toe iron converge from the hinges. A spring urges the soleholder member to its normal position.

3,656,775
WINTER-SPORT DEVICE
Willy Friedrich Krautter, P.O. Box 217, Portland, Pa.
Filed Oct. 13, 1970, Ser. No. 80,323
Int. Cl. B62b 13/14
U.S. Cl. 280—16 5 Claims



A sport vehicle having a support ski supporting a frame, a steering ski mounted on the frame and adapted to be aligned with the support ski and outrigger skis having flexible connections to the frame to permit individual displacement of each outrigger ski by the foot between a normal position parallel to the axis of the frame and a plowing position in which the outrigger ski points forwardly and inwardly toward the longitudinal axis of the frame and in which the outer edge of the ski is elevated relative to its inner edge.

3,656,776
SEMI-TRAILER
Helmut Steiner, Freiherr-vom-Stein-Strasse 1, 5284 Wiehl, Germany
Filed Nov. 28, 1969, Ser. No. 880,777
Claims priority, application Germany, Dec. 2, 1968, P 18 12 153.4
Int. Cl. B62d 53/06
U.S. Cl. 280—81 A 3 Claims



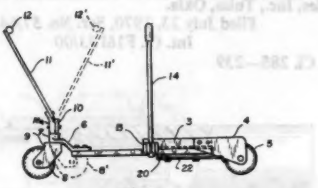
A semi-trailer which has at least one track alignment axle pivotally movable about the vertical central axis of said axle, which latter has associated therewith locking means operable positively to prevent said axle from pivoting about said axis when said semi-trailer is moving along a substantially straight path.

3,656,777

SCOOTER-LIKE TOY VEHICLE

David Howard Keiser, Jr., 53 Park Road, Wyomissing Hills, Reading, Pa.

Filed Sept. 12, 1969, Ser. No. 857,608
Int. Cl. B62k 9/00; B62b 11/00
U.S. Cl. 280—87.04 B 5 Claims



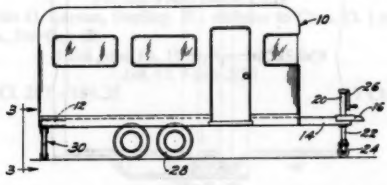
A scooter-like toy vehicle embodying a modified three wheel construction including a forward steering wheel and two widely separated rear wheels between which a platform of very substantial area is supported. The steering wheel, when rotated 180°, may be used as a tow for pulling the vehicle, such as when the platform is loaded with groceries, newspapers or the like. Upstanding side handles are provided for steadying the rider.

3,656,778

LEVELLING AND STABILIZING MEANS FOR HOUSE TRAILERS

Ross W. Bristol, 1201 Ashford Drive, Bissell Hills, County of St. Louis, Mo.

Continuation-in-part of application Ser. No. 819,843, Apr. 28, 1969, now abandoned. This application Dec. 7, 1970, Ser. No. 95,810
Int. Cl. B60s 9/02
U.S. Cl. 280—150.5 18 Claims



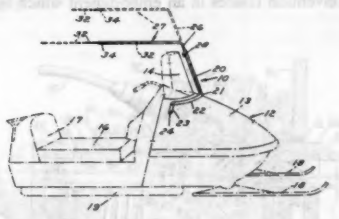
Support means for levelling a trailer when parked and for stabilizing it against rocking and swaying comprising a pair of struts pivotally connected to a horizontal support member carried by the trailer, the struts being arranged to swing between downwardly inclined operative positions with their free ends engaging a parking surface to retracted positions parallel with the support member, the struts each including a brace pivotally connected at one end to the strut and arranged to selectively engage a series of abutments along the support member at its free end whereby the struts may be independently braced in the positions of inclination required to level the trailer, and the braces each comprising two links pivotally connected to form a toggle whereby the struts and braces may be conveniently stressed to stabilize the trailer.

3,656,779

DEFLECTION BAR UNIT FOR SNOWMOBILES

Virgil Clungan, 9792 Buckingham, Allen Park, Mich.

Filed June 30, 1970, Ser. No. 51,130
Int. Cl. B60r 19/00
U.S. Cl. 280—150 B 14 Claims



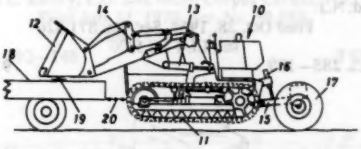
An upwardly and rearwardly extending deflection bar device is mounted before the windshield of a conventional winter sport or recreation vehicle, extending above the driver and a possible passenger to protect from danger of injury occasioned by his striking fence wires or other low-lying objects on property traversed by the vehicle. An upward or downward adjustment of the protective bar unit at an upright mast portion thereof accommodates a kneeling posture of the driver; and an adjustable rearward extension of a generally horizontal portion of the unit affords protection to both the driver and an occupant of the vehicle behind him. Single bar and dual forked bar versions of the unit are shown.

3,656,780

TRANSPORT OF TRACK-LAYING VEHICLES

Carl Gustaf Nordstrom, Klammerdammsgatan 13, S-302, 42 Halmstad, Sweden

Filed Nov. 5, 1969, Ser. No. 874,350
Claims priority, application Sweden, Nov. 7, 1968, 15085/68; Oct. 13, 1969, 14013/69
Int. Cl. B62d 53/00, 53/06
U.S. Cl. 280—415 R 5 Claims



A method of simplifying the transport of a track-laying vehicle having an implement which can be raised and lowered at its forward as well as at its rearward end, in which the implement at the forward end of the track-laying vehicle is brought into engagement with a coupling pin projecting upwardly from the floor of a towing vehicle by means of a socket or opening disposed in the bottom of the implement, and the rearward end of the track-laying vehicle is thereupon raised by depressing a wheeled axle unit against the ground, the axle unit comprising a frame or like structure on which wheels are rotatably mounted whereafter the track-laying vehicle can be towed by a truck like a trailer while on the wheels of the axle unit.

3,656,781

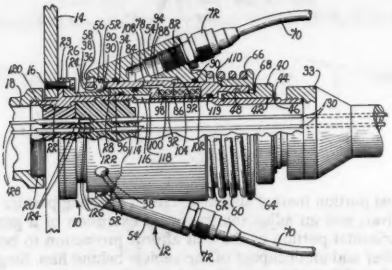
QUICK-DISCONNECT COUPLING

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Allan R. McDougal, 5432 Vista Del Arroyo, LaCrescenta, Calif., and Douglas P. Davis, 911 East Elmwood, Burbank, Calif.

Filed Aug. 21, 1970, Ser. No. 66,004
Int. Cl. F16l 37/22
U.S. Cl. 285—3 4 Claims

A quick-disconnect coupling particularly suited for use in coupling umbilical leads, including electrical cables and fluid conduits, characterized by a pair of coaxially related

coupling components interconnected through an annular array of balls operatively seated within an annular locking groove established by a radially extended shoulder, and maintained in operative disposition by an axially reciprocable circumscribing locking ring spring-biased into an operative disposition relative to the array. A particular feature of the instant invention resides in an embodiment which includes a

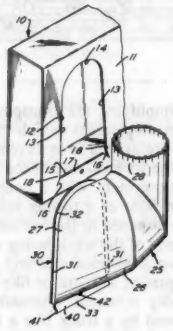


sealed gas generator operatively associated with the locking ring for positively displacing the locking ring, relative to the array, for thereby achieving a release of the balls, and an axially displaceable, actuating sleeve so coupled with the generator that the generator also serves to initiate a positive separation of the coupling components as the balls are released.

3,656,782
DUCT STRUCTURE

Angelo R. Molino, 816 East Building, Haddonview, Haddonfield, N.J.

Filed Oct. 28, 1969, Ser. No. 871,820
Int. Cl. F16l *5/00*
U.S. Cl. 285—189 **9 Claims**

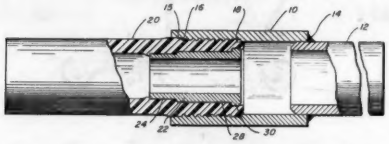


A duct structure comprising a duct having a sidewall with an opening having opposite side edges and end edges extending between said said side edges, said side wall being formed with cuts extending from said opening laterally outward adjacent to one end edge, and a generally tubular open-ended take-off having one end generally similar to and larger than said sidewall opening and located outwardly of said duct with said one take-off end proximate to said sidewall opening, said take-off having a flange extending partially about said one take-off end conformably along the other end edge and side edges of said opening interiorly of said duct, said flange being provided with a groove extending therealong into said take-off and slidably receiving said other end edge and side edges of said opening, said take-off being slidably removable away from said opening with said flange engaged in said cuts, said take-off having a lip projecting from said one take-off end extending along said one end edge in facing engagement with the exterior of said sidewall.

3,656,783
TRANSITION PIPE JOINT

Charles H. Reeder, Tulsa, Okla., assignor to W & R Industries, Inc., Tulsa, Okla.

Filed July 23, 1970, Ser. No. 57,642
Int. Cl. F16l *33/00*
U.S. Cl. 285—239 **12 Claims**

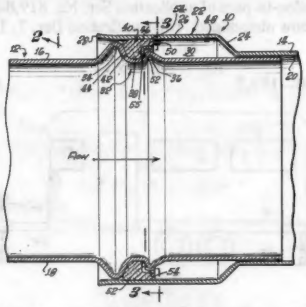


A transition connection for metal to plastic pipe wherein the plastic pipe, such as polyethylene, is cold-extruded to form a high tensile strength sealed connection.

3,656,784
SLIP JOINT

Robert W. Dow, Tujunga, and Arthur L. Moore, Mission Hills, both of Calif., assignors to SSP Industries, Burbank, Calif.

Filed Apr. 1, 1970, Ser. No. 24,560
Int. Cl. F16l *55/00*
U.S. Cl. 285—187 **5 Claims**



An adjustable slip joint adapted to be interposed in a tubular structure which may be varied in length due to exposure to very high temperatures and is normally under pressure. The joint includes telescoping first and second tubular members forming the tubular structure wherein a sealing means is interposed between the respective members. The sealing means is to prevent excessive pressure leakage from said tubular structure through said joint.

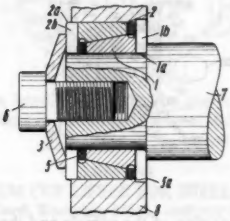
3,656,785
HUB-TO-SHAFT CONNECTION

Peter Lothar, Guglingen, Wurtt, Germany, assignor to Oskar E. Peter, Brackenheim, Germany

Filed Dec. 7, 1970, Ser. No. 95,763
Claims priority, application Germany, Mar. 14, 1970, P 20 12-256.9
Int. Cl. F16d *1/06*
U.S. Cl. 287—52.06 **8 Claims**

A frustro-conical holding ring is adapted to seat on a shaft; a closed outer holding ring having an internal frustro-conical surface seats and surrounds the first holding ring. To center

these rings on the shaft and within the hub, cylindrical centering rings adapted to seat against the inner surface of the hub and on the shaft are formed adjacent the thicker ends of each of said rings, the cylindrical centering rings extending over a radial distance greater than the thickness of the thickened end to overlap the thinner end of the other ring, and center the holding rings on the shaft and within the hub. Disks of elastic material, such as rubber or plastic disks may

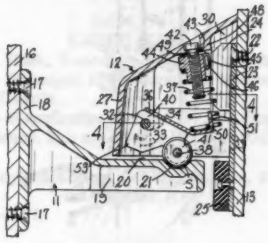


be located between the end faces of a holding ring and the inner end face of the centering ring adapted to fit thereagainst to form an elastic and sealing insert. The entire arrangement can be tightened by relative axial shifting of the two holding rings against each other, for example by circumferentially arranged holding screws, a central screw with an interposed disk spring or the like. The center rings may be radially slitted, the radial slits extending into the holding rings.

3,656,786
PANEL FASTENER CLIP
Charles O. Larson, Sterling, Ill., assignor to Chas. O. Larson Co., Sterling, Ill.
Filed June 10, 1970, Ser. No. 45,049
Int. Cl. F16b *2/20*
U.S. Cl. 287—189.35 **7 Claims**

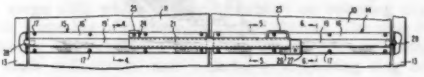
The present invention relates generally to spring type fastener clips, and more particularly to improvements in fastener clips of the type adapted to accommodate the margins of panels. The embodiment disclosed herein includes a sheet metal stamping presenting an elongate relatively narrow base section and laterally yieldable converging panel engaging wing members extending from opposite longitudinal margins of said base section. The opposite extremities of the outer marginal edges of said wing members diminish in distance from the base section to facilitate initial reception of a panel margin, and integral struck-out panel attachment prongs extend from the base section in a direction opposite to the wing members.

3,656,787
DOOR STOP AND HOLDER
Leo Coopersmith, Ivoryton, Conn., assignor to The H. B. Ives Company, New Haven, Conn.
Filed July 23, 1970, Ser. No. 57,513
Int. Cl. E05c *19/04*
U.S. Cl. 292—79 **4 Claims**



This disclosure relates to a door stop and holder wherein a spring-biased detent carried by one member is urged into a slot therefor defined in another member to provide a latching action therebetween where one member is mounted to a door and the other member is mounted to an adjacent stationary member.

3,656,788
DOUBLE DOOR SECURITY BOLT ASSEMBLY
William L. Emery, P.O. Box 6058, Corpus Christi, Tex.
Filed July 31, 1970, Ser. No. 59,989
Int. Cl. E05c *1/04*
U.S. Cl. 292—148 **3 Claims**

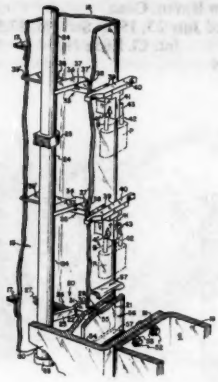


A high strength security bolt assembly for double doors of commercial establishments and the like affords security on both sides of the door when in the active locking position bridging both door leaves. The device features separate self-contained assemblies which are mounted with through bolts on each door leaf and a sliding locking tube which spans or bridges components of each assembly when in the active locking position. The assemblies are reversible to accommodate any arrangement of active and inactive door leaves.

3,656,789
MULTIPLE LOCKING MECHANISM FOR A COMMON LATCH MEANS FOR A CLOSURE
Joe R. Ray, 1798 Grace Avenue, San Jose, Calif.
Filed Oct. 2, 1970, Ser. No. 77,652
Int. Cl. E05b *15/02;* **E05c** *3/22, 19/00*
U.S. Cl. 292—304 **10 Claims**

A series of independently lockable and operable latch operating means on a concealed latch mechanism for closure member such as a gate, door and the like facilitating opening of the latter upon removal of a single lock confined within a jamb post of an opening although all other locks are secured and including suitable covering and guard means for the con-

cealed latch mechanism to prevent unlocking of the closure member other than by persons authorized and licensed to a particular lock receiving portion of a multiple locking mechanism therefor.



3,656,790

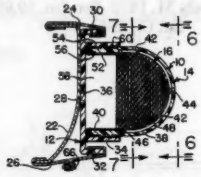
VEHICLE PRE-LOADED IMPACT-CUSHIONING DEVICE

Robert E. Truesdell, Rochester, Mich., assignor to William H. Nienstedt, Detroit and Benjamin W. Colman, Southfield, Mich., part interest to each

Filed Oct. 12, 1970, Ser. No. 79,954

Int. Cl. B60r *19/10, 21/00*

U.S. Cl. 293—1 **34 Claims**



An inflatable vehicle front end impact-cushioning device mounted on its forward end within a rupturable container securing an inflatable bag in compact form under gas pressure. Upon impact of the container with a resistant object, and at a substantially low speed of from about three miles to about 10 miles per hour, the forward portion of the device ruptures allowing the inflatable bag to promptly expand, inflate, overlie and protect the forward-facing portion of the vehicle and the facing surface or surfaces of the object struck by the vehicle, whereby the inflated bag is positioned between the impacted object and the forward-facing portion of the vehicle to cushion the latter against substantial damage. The inflatable bag is designed, when expanded, to cover, overlie and protect the forward-facing portion of the vehicle.

3,656,791

VEHICLE IMPACT-CUSHIONING DEVICE

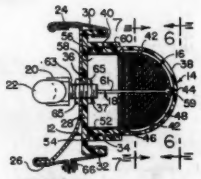
Robert E. Truesdell, Rochester, Mich., assignor to William H. Nienstedt, Detroit and Benjamin N. Colman, Smithfield, Mich., part interest to each

Filed Oct. 12, 1970, Ser. No. 79,996

Int. Cl. B60r *19/10, 21/00*

U.S. Cl. 293—1 **35 Claims**

An inflatable vehicle front end impact-cushioning device mounted on its forward end within a rupturable container securing an inflatable bag in compact form, in combination with a valved cylinder containing gas under pressure. Upon impact of the container with a resistant object, and at a substantially low speed of from about 3 miles to about 10 miles per hour, the forward portion of the device ruptures, triggering the gas valve and allowing the inflatable bag to promptly expand and inflate with gas, and to overlie and protect the forward-facing portion of the vehicle and the facing surface or surfaces of the object struck by the vehicle, whereby the inflated bag is positioned between the impacted object and the forward-facing portion of the vehicle to cushion the latter against substantial damage. The inflatable bag is designed, when expanded, to cover, overlie and protect the forward-facing portion of the vehicle.



3,656,792

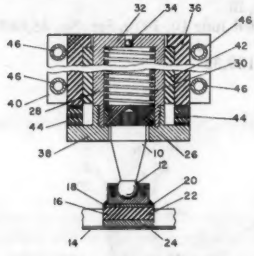
SAFETY CONSTRUCTION FOR VEHICLES

Joseph V. Tavano, Sr., 26 Whitney Street, Milford, Mass.

Filed July 16, 1970, Ser. No. 55,509

Int. Cl. B60r *19/08*

U.S. Cl. 293—85 **2 Claims**



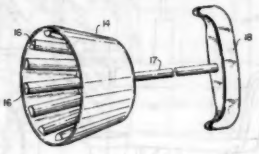
Safety construction for vehicles particularly adapted to absorb and dissipate kinetic energy resulting from a crash whether head-on, from the rear, or at an angle with respect to the front and rear bumpers thereof comprising a bumper for attachment to the frame of a vehicle, a piston rod, a ball on the rod, a first shock pad on the bumper, a socket on the first shock pad receiving the ball, a cylinder open at one end facing the first shock pad and the piston rod, the cylinder having a closed bottom at its end opposite its open end, a spring in the cylinder, a piston fixedly mounted on the piston rod in the cylinder, the spring urging the piston toward the open end of the cylinder, a second shock pad mounting the cylinder including a shield surrounding the cylinder in spaced relation thereto, an elastomeric sleeve connecting the sleeve and the cylinder, and a mount for connecting shield to the vehicle frame.

3,656,793

EXTENSION FOR BATH FAUCET VALVE OPERATORS

James Kenneth Mathews, 5005 North 15th Street, Arlington, Va.

Filed Apr. 23, 1970, Ser. No. 31,148
Int. Cl. A47f 13/06
U.S. Cl. 294—19 R 3 Claims



An extension handle to be used by one for manipulating the valve operators in a bathtub or shower stall.

3,656,794

VACUUM CUP LIFTER FOR SHELL EGGS

Robert C. McCord, Romulus, Mich., assignor to Diamond International Corporation, New York, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,399
Int. Cl. B66c 1/02
U.S. Cl. 294—64 R 6 Claims

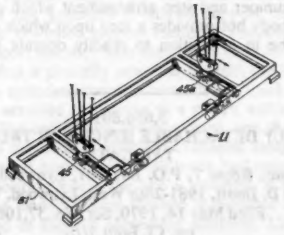
A vacuum cup lifter having a neck portion adapted to be connected to a vacuum means, a thin flexible lip particularly adapted to lifting shell eggs to be transported and deposited for processing or packing, and intermediate bell portions providing gentle yet stable lifting and carrying characteristics.

3,656,795

SPREADER SKEW ARRANGEMENT

James C. White, Jr., and Roger L. Wolfe, both of Longview, Tex., assignors to R. G. Le Tourneau Inc., Longview, Tex.

Filed June 30, 1970, Ser. No. 51,207
Int. Cl. B66c 1/00
U.S. Cl. 294—67 R 4 Claims



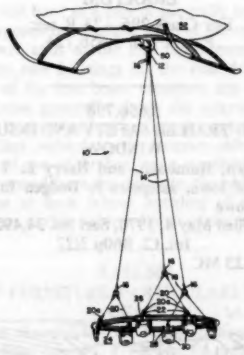
In cargo-handling apparatus having a spreader conformably fitting and attaching to a cargo container, the improvement characterized by having a carriage means supportingly engaging a transverse support member of the spreader such that the carriage means is reciprocally movable laterally of the spreader so as to be able to move at least one end of the spreader to skew it over such that its conforming corner attachments will mate with those on the cargo container. Also disclosed are specific preferred arrangements wherein the spreader is moved with respect to the carriage by a fluid powered cylinder, piston and shaft arrangement; and wherein movable carriages are employed at each end of the spreader for doubling the amount of skew attainable.

3,656,796

CARGO SLING

Lionel H. J. Cook, Vancouver, British Columbia, Canada, assignor to Okanagan Helicopters Ltd., Vancouver, British Columbia, Canada

Continuation of application Ser. No. 737,782, June 17, 1968, now abandoned. This application July 13, 1970, Ser. No. 64,004
Claims priority, application Canada, Aug. 24, 1967, 998 610
Int. Cl. B66c 1/34
U.S. Cl. 294—78 R 2 Claims



A cargo sling which maintains stability on releasing any one of a number of loads being carried thereby. The sling is releasably connected to a supporting structure for releasing the loads collectively, and includes a supporting ring or equivalent thereof for supporting a plurality of cargo hooks. Each hook is preferably operable automatically, and is connected substantially unyieldingly to the supporting structure by means of an interconnected plurality of suspension arms and a corresponding plurality of sling arms. Such arms are completely interchangeable and, under load, assume a conical configuration wherein the centre of gravity is located so as to assure stability of the load during any vertical, transverse or translational motion of the cargo sling and load. The cargo sling is particularly adapted for use with helicopters.

3,656,797

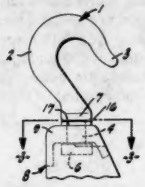
HOIST HOUSING-HOOK COMBINATION

Ralph A. Ratcliff, 614 Mountain View Avenue P.O. Box 543, Belmont, Calif.

Filed Apr. 2, 1970, Ser. No. 25,211
Int. Cl. B66c 1/34
U.S. Cl. 294—82 R 9 Claims

An improved and simplified arrangement for pivotally connecting a hook with the housing of a load supporting device. The conventional threaded shank end, nut and locking pin commonly employed heretofore are eliminated. An improved housing top wall construction, which includes a laterally opening hook receiving recess and a seating depression therein, are provided so that an enlarged flange on the shank portion of the hook may be slidably inserted into the recess

and seated in the depression. Stop means, in one embodiment comprising a retaining ring, is operatively engaged with the shank portion to maintain the flange seated in the recess



depression so that separation of the hook from the housing is positively precluded. The shank portion and retaining flange are formed in one piece to simplify and reduce manufacturing procedures and costs.

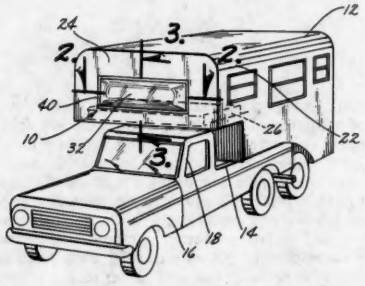
ERRATUM

For Class 296—23 R see:
Patent No. 3,656,724

3,656,798
CAMPING TRAILER SAFETY AND INSULATING WINDOW

John N. Dodgen, Humboldt, and Harry L. Taylor, Dakota City, both of Iowa, assignors to Dodgen Industries, Inc., Humboldt, Iowa

Filed May 4, 1970, Ser. No. 34,492
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 MC **7 Claims**



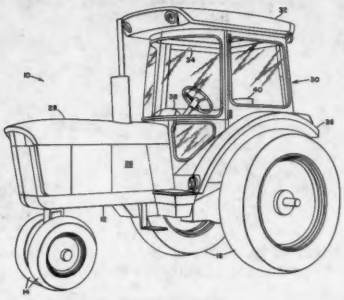
A pickup-type camper having a forward window in a sleeping compartment over the cab of the truck wherein the window includes a first window in the plane of the front compartment wall and a second window spaced forwardly therefrom and having a convex forwardly configuration. Molding fasteners secure the two windows together and to the front compartment wall.

3,656,799
VIBRATION ISOLATED UNITARY CAB AND CONTROL CONSOLE CONSTRUCTION FOR A TRACTOR

Donald Irwin Malm; Craig Eugene Christie, both of Cedar Falls, and Claire Eugene Rojohn, Denver, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Apr. 14, 1970, Ser. No. 28,328
Int. Cl. B62d *27/04*
U.S. Cl. 296—35 R **19 Claims**

A tractor is provided with a unitary cab and control console construction which is secured to the tractor chassis by resilient mount assemblies which provide vibration isolation. The cab is disconnectible from the control console and during assemblage of the tractor, the control console may be

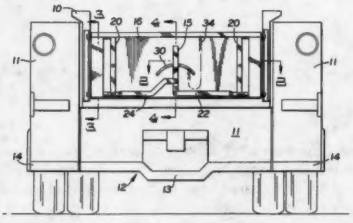


mounted as a unit on the tractor chassis to provide controls for testing the working of and/or for moving the tractor before completing assembly of the tractor by adding the cab.

3,656,800
DUMP BODY TAILGATE WITH DOUBLE ACTION PIVOT AND LOCK MECHANISM

Frank C. Timmons, and Carl Smith, both of Columbus, Ohio, assignors to Timmons Metal Products Company, Columbus, Ohio

Filed Mar. 27, 1970, Ser. No. 23,353
Int. Cl. B62d *25/00*
U.S. Cl. 296—50 **3 Claims**



A tailgate for a dump body provided with upper and lower hinge pivots and locking arrangements which are normally in locked condition but can be selectively actuated to hinge either the upper edge or the lower edge for swinging respectively up or down relative to the body during dumping. The selection is made by means of a single control lever connected to the pivot and locking arrangements by linkage which permits movement of the single lever from a central locking position in either of opposite directions to make the selection. The dump body is further provided with a combination bumper and step arrangement which not only protects the body but provides a step upon which a person can stand to be in a position to readily operate the selection lever.

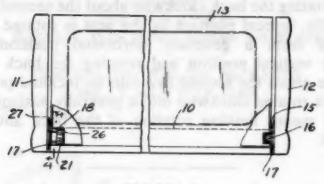
3,656,801
QUICKLY DETACHABLE HINGE FOR TRUCK BODY TAILGATE

Oliver Doutt, Route 7, P.O. Box 801, Lynwood, Wash., and Thomas D. Doutt, 1981-28th West, Lynwood, Wash.

Filed May 14, 1970, Ser. No. 37,106
Int. Cl. B60j *5/10*
U.S. Cl. 296—57 R **3 Claims**

This is a replacement hinge for a truck body tailgate which is normally movable between an upright closed position and an approximately horizontal open position but can be

released for further downward movement, said hinge comprising a socket part having a longitudinal slot in it and another part having a flat hinge stud, one of said parts being secured to an end of the tailgate and the other part to a side



wall of the truck body, the hinge stud and the slot in the socket being dimensioned and positioned so the stud can pass sidewise through the slot when the tailgate is lowered below its normal horizontal position thus providing for quick and easy removal of and replacement of the tailgate.

3,656,802

AUTOMATICALLY RETRACTABLE TRUCK COVER

Walter D. White, 815 Middle Road, Acushnet, Mass.

Filed Nov. 10, 1970, Ser. No. 88,426
Int. Cl. B60p *7/04*
U.S. Cl. 296—100 **3 Claims**

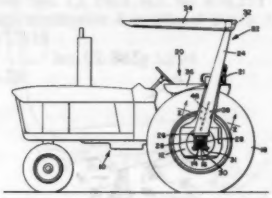
An automatically retractable cover for a truck particularly of the dump truck type wherein the cover is attached at its forward edge to a horizontal rod mounted transversely atop the forward portion of the cab protection platform of the truck bed. The rear edge of the cover is attached to the cross member of the generally U-shaped support member. The arms of the U-shaped support member. The arms of the U-shaped support member have their outer ends fixedly secured to a shaft that is pivotally mounted beneath the truck bed. A piston in a cylinder mounted beneath the truck bed has its piston rod actuated responsive to a switch within the cab of the truck. The rod in turn drives a crank arm that is radially attached to the shaft to pivot the U-shaped support member from a forward position with the truck bed uncovered, to a rearward position where the bed is covered. A shaft having three spring loaded pulleys thereon is mounted beneath the forward end of the cab protection platform. Cables on the pulleys pass upwardly through apertures in the platform then around a second set of pulleys mounted atop the platform. Next the cables are threaded through rings attached along the length of the canvas with the ends of the cables being attached to cross member.

3,656,803

TRACTOR ROLL BAR

Clarence Edward Brown, and Norman Frederick Lemmon, both of Cedar Falls, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 27, 1970, Ser. No. 67,422
Int. Cl. B62d *25/06*
U.S. Cl. 296—102 **6 Claims**



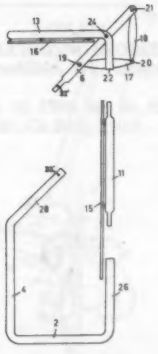
A tractor roll bar has a pair of generally upright box beam members disposed on opposite sides of the operator's station with the lower ends of the box beam members rigidly attached to the axle housings for the rear drive wheels. The upper ends of the box beam members are connected by a transverse beam generally above the operator's seat. Each upright box beam member has an elongated, longitudinally extending plate welded to the interior side of one of the lateral sides of one of the box beam members and projecting toward and spaced from the opposite, the plates engaging the opposite side to limit lateral buckling of the upright box beam members during a side rollover of the tractor.

3,656,804

PIECE OF FURNITURE, PARTICULARLY A CHILD'S CHAIR

Knud Nielsen, Masebakken 16, Virum, Denmark

Filed Aug. 19, 1970, Ser. No. 65,057
Claims priority, application Denmark, Aug. 20, 1969, 4472/69
Int. Cl. A47c *9/04*
U.S. Cl. 297—170 **3 Claims**

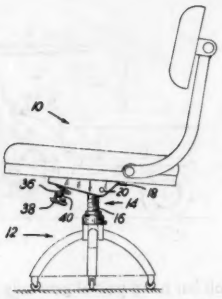


The invention relates to furniture, particularly a child's chair, formed with table and seat portions arranged in such manner that the furniture is useable in two positions, in one of which it is independently useable and in the other of which it is useable in conjunction with a further piece of furniture, i.e., a dining table.

3,656,805
CHAIR CONTROL AND SUPPORT

Carl J. Engstrom, Michigan City, Ind., assignor to Interroyal Corporation, New York, N.Y.

Filed Sept. 15, 1969, Ser. No. 857,922
Int. Cl. A47c 3/00
U.S. Cl. 297—302 6 Claims

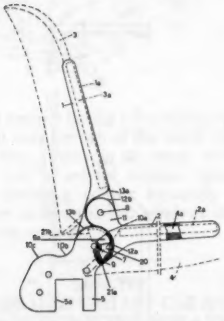


An improved tilt control and support mechanism for a chair seat assembly utilizing a simplified sturdy construction wherein a single plate-like element functions to support the seat assembly and, in cooperation with an adjustable compression spring, yieldably restrains the tilt movement of the chair seat in a uniform and controlled manner to permit the occupant to bring the chair seat to a comfortable tilted rest position and return it to a substantially horizontal position.

3,656,806
CHAIR OR THE LIKE WITH BACK AND SEAT FOLDABLE IN UPRIGHT POSITION

Leonida Castelli, and Giancarlo Piretti, both of Bologna, Italy, assignors to Anonima Castelli s.a.s., Bologna, Italy

Filed Apr. 13, 1970, Ser. No. 27,524
Claims priority, application Italy, May 23, 1969, 37,339 A/69
Int. Cl. A47c 1/02
U.S. Cl. 297—324 8 Claims

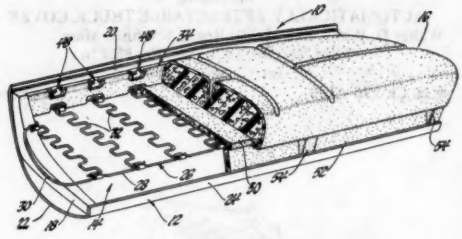


A chair of the like used in public halls permitting the occupant when seated to assume an anatomically correct position while permitting both the seat and back to be folded into a substantially vertical position permitting the occupant to rise and stand comfortably while permitting others to pass in front should the chairs be connected together in a row. The chair comprising a support, a seat, first coupling means connecting the support and the seat about a first transverse axis about which the seat rotates, a back, second coupling means connecting the back and seat about a second axis parallel to the first axis permitting the second axis to rotate thereabout, guide means cooperating with the first and second coupling means rotating the back clockwise about the second axis into a generally vertical position as the seat is rotated counterclockwise from a generally horizontal position into a generally vertical position and rotating the back counterclockwise about the second axis into an inclined position as the seat is rotated clockwise into a generally horizontal position and means limiting rotation of the back and seat as aforesaid.

3,656,807
VEHICLE SEAT ASSEMBLY

Louis K. Arida, Detroit; Edmond R. Gionet, Warren, and Donald E. Gunlock, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1970, Ser. No. 81,277
Int. Cl. A47c 7/02, 23/02, 23/00
U.S. Cl. 297—452 5 Claims

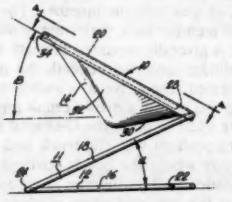


A vehicle seat assembly having a spring support for a seat cushion that includes a plurality of sinuous spring members extending between a border wire and a vertically disposed diaphragm. The sinuous spring members are located in a horizontal plane and encapsulated within a slab of high density plastic foam material, the front end of which is integrally formed with a block of high density foam material. The block serves as a support for maintaining the spring assembly at a predetermined distance above the seat frame.

3,656,808
CHAIR

Ching-Yu Chang, Manoa Park Apts. - E115, 400 Glendale Road, Havertown, Pa.

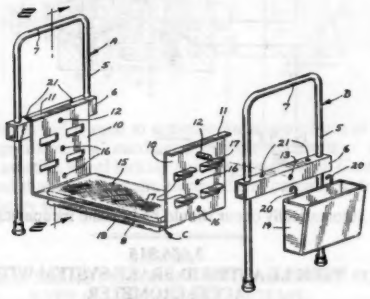
Filed June 9, 1970, Ser. No. 44,699
Int. Cl. A47c 1/12
U.S. Cl. 297—445 11 Claims



A chair characterized by a frame structure formed by a single frame member having a continuously curved shape. The frame member includes an arcuate planar floor engaging portion, an arcuate inclined riser portion, and an inclined ar-

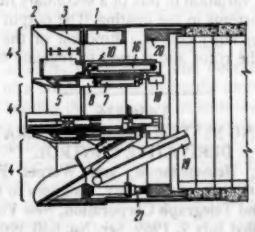
cuate seat support portion. A seat is suspended from the frame seat support portion and may be fabricated of flexible material such as fabric, or may be of a rigid material such as molded plastic.

3,656,809
SERVICE STOOL
Jacob A. Ronning, 3525 Irving Avenue South, Minneapolis, Minn.
Filed Aug. 14, 1970, Ser. No. 63,716
Int. Cl. A47c 9/12, 7/50
U.S. Cl. 297—461 2 Claims



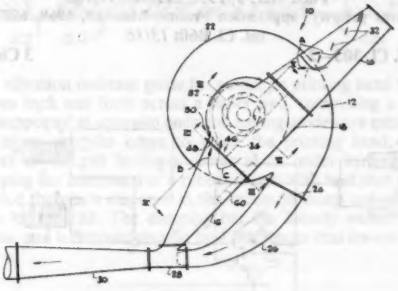
A utility stool having vertically spaced end frames connected by a generally U-shaped body member that is detachably connected to the frames in either of two vertically reversed positions, and at various elevations in either of such positions, together with means for supporting a variety of attachments.

3,656,810
TUNNELING SHIELD
Vladimir Alexandrovich Khodosh, ulitsa Burdenko, 16/12, kv. 16; Valentin Alexandrovich Ivanov, ulitsa Konstantinova 4, kv. 25; Sergei Fedorovich Salov, ulitsa Akademika Koroleva, 9, korpus 2, kv. 284; Arkady Ivanovich Mozhaev, Khavsko-Shabolovsky pereulik, 11, kv. 446; Evstafy Andreevich Vasilenko, Rizhsky proezd, 1/5, kv. 50; Pavel Semenovich Burtsev, Bolshoi Chudov pereulik, 8a, kv. 4; Kazimir Stanislavovich Anchevsky, ulitsa Obraztsova, 12, kv. 14; Leonid Ivanovich Savelev, Otkrytoe shosse, 29, korpus 4, kv. 58; Evgeny Moiseevich Bolotin, Otkrytoe shosse, 24, korpus 25, kv. 12, and Leonid Konstantinovich Khaidurov, otkrytoe shosse, 24, korpus 5G, kv. 31, all of Moscow, U.S.S.R.
Filed Jan. 29, 1970, Ser. No. 6,798
Claims priority, application U.S.S.R., Feb. 8, 1969, 1303473
Int. Cl. E21d 23/00
U.S. Cl. 299—33 1 Claim



A tunneling shield for soft loose soils, whose face working space is divided into several decks accommodating the working tools the latter being installed so that they can move not only forward and backward but also from one side to the other.

3,656,811
PNEUMATIC TRANSPORTATION OF MATERIALS AND APPARATUS THEREFOR
Ralph R. Raad, 8 Astoria Main Road, Three Anchor Bay, Republic of South Africa
Filed Nov. 13, 1969, Ser. No. 876,271
Claims priority, application Republic of South Africa, Nov. 18, 1968, 68/17515
Int. Cl. B65g 53/04
U.S. Cl. 302—23 16 Claims



A machine for the pneumatic transportation of material in which the material to be transported is sucked downwardly along an inclined passage part of which is in the form of a suction chamber having an upper material inlet and a lower material outlet. An air outlet leads from the suction chamber, the axis of the outlet being transverse to the axis of the passage. An air displacing device such as a fan has its inlet aligned with and connected to the air outlet from the chamber. The pressure side of the fan is connected to a device such as a venturi to which the material which has passed from the suction chamber through the lower outlet is also fed, the air and material then flowing from the venturi device along a delivery duct. The suction chamber has therein arrangements for the removal of fines from the air flowing towards the air outlet.

3,656,812
DEVICE FOR FLUIDIZING STORED MATERIAL
Douglas C. Steltz, Brookfield, Wis., assignor to Portec, Inc., Waukesha, Wis.
Filed Sept. 18, 1969, Ser. No. 858,937
Int. Cl. B65g 53/40
U.S. Cl. 302—53 4 Claims

A device for injecting a gas into bulk material stored within a vessel to enhance the flow characteristics of the

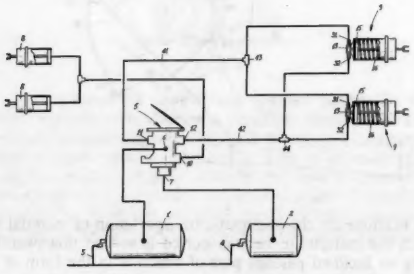
material. The device includes a housing to be mounted within an opening in the wall of the vessel and having a connection to a source of gas under pressure. The housing supports a porous metal filter element which permits the flow of gas into the material confined within the vessel but prevents the escape of the material into the pressurized gas system. The housing is designed so that it can be attached to the vessel wall entirely from the exterior of the vessel.

3,656,813

SINGLE-PISTON BRAKE CYLINDER FOR A DOUBLE-CIRCUIT COMPRESSED-AIR BRAKE SYSTEM

Jean Gachot, 179 Avenue de la Division Leclerc, Enghien, and Fernard Perales, 87 rue A. G. Belin, Argenteuil, both of France

Filed Mar. 9, 1970, Ser. No. 17,765
Claims priority, application France, Mar. 19, 1969, 6907886
Int. Cl. B60t *13/36*
U.S. Cl. 303—2 **3 Claims**



A single-piston brake cylinder for a double-circuit brake system consisting of a main application circuit and an emergency application circuit. A double check-valve is fixed on the cylinder and has its two admission ports connected respectively to the main circuit and to the emergency circuit whilst the discharge port of said check-valve is adapted to communicate with said cylinder. The flap of the double check-valve cannot become oxidized and impurities are not liable to accumulate in its vicinity since this flap operates continuously under normal service conditions. This ensures safe operation of the emergency circuit.

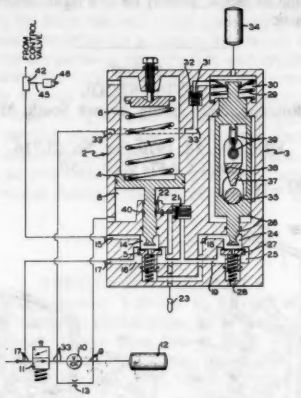
3,656,814

MONITORING DEVICE FOR FLUID PRESSURE SYSTEMS

Fritz Scheele, Munich; Josef Frania, and Walter Ortmann, both of Hannover, all of Germany, assignors to Westinghouse Bremsen-und Apparatebau G.m.b.H., Hannover, Germany

Filed Aug. 17, 1970, Ser. No. 64,478
Claims priority, application Germany, Nov. 15, 1969, P 19 57 561.2
Int. Cl. B60t *7/14*
U.S. Cl. 303—19 **12 Claims**

This invention relates to fluid pressure operable railway locomotive safety control apparatus which requires certain periodic acknowledging operations by the locomotive engineer to forestall a penalty brake application which will be automatically effected should the engineer fail to perform the required acknowledging operation within a certain time subsequent to the sounding of an alarm signal or whistle. This apparatus, when installed on locomotives having only an engineer in the cab, requires that he, following each sounding of the alarm signal, either after a certain time interval or subsequent to a chosen distance traveled, manually operate an acknowledging valve to prevent a brake application which will automatically occur should he become incapacitated.

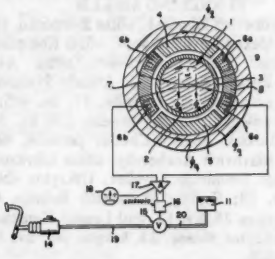


3,656,815

VEHICLE ANTISKID-BRAKE-SYSTEM WITH ACCELEROMETER

Abootaleb Talebi, Ober Roden-Messenhausen, and Erwin Schlitz, Heusenstamm, both of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Germany

Original application Feb. 12, 1969, Ser. No. 798,636, now Patent No. 3,555,326, dated Jan. 2, 1970. Divided and this application Apr. 9, 1970, Ser. No. 33,140
Claims priority, application Germany, Feb. 17, 1968, P 16 73-443.3
Int. Cl. B60t *8/16*
U.S. Cl. 303—21 CG **9 Claims**



An antiskid-brake-system accelerometer has a solid cylindrical ferromagnetic rotor rotationally coupled to a vehicle wheel and coated with a conductive nonferremagnetic metal sheath. Magnets create a radial primary flux through the rotor while pickup coils located on the stator outside this field sense any variation in flux of a secondary field produced by the eddy currents in the coating. The output of these differentiating (pickup) coil is a function of the angular acceleration of the rotor and is used to regulate braking force in the wheel.

3,656,816

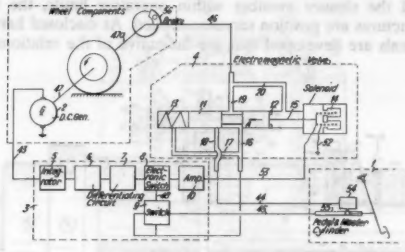
BRAKING SYSTEM WITH DECELERATION DERIVATIVE CONTROL

Erwin Schlitz, Heusenstamm, and Werner Fink, Frankfurt am Main, both of Germany, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 9, 1969, Ser. No. 840,390
Int. Cl. B60t *8/08*; F15b *13/02*
U.S. Cl. 303—21 P **7 Claims**

A wheel anti-lock braking device especially adapted to au-

tomotive systems is described. A wheel tachometer generator develops an angular velocity signal, which, twice differentiated, becomes the derivative of acceleration or a term herein called "ruck." This term indicates angular accelera-



tion changes and is used to optimize braking pressure at the point approximating maximum tire-to-road friction and thereby averting wheel locking and consequent skid. Control is effected through a partially electrical and partially hydraulic regulatory servomechanism.

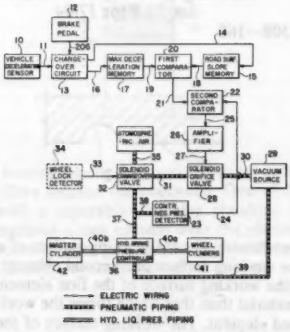
3,656,817
ANTISKID BRAKE PRESSURE CONTROL DEVICE FOR HYDRAULIC BRAKING SYSTEMS

Toshiaki Okamoto; Masami Inada; Katuki Takayama; Tatsuo Hayashi; Koji Nishida; Naoji Sakakibara, and Masao Kamiya, all of Toyota-shi, Japan, assignors to Aisin Seiki Company Limited, Toyota-shi, Japan

Filed Oct. 13, 1969, Ser. No. 865,848

Claims priority, application Japan, Oct. 11, 1968, 43/74480; Oct. 12, 1968, 43/74328; Nov. 9, 1968, 43/82662; 43/82663; Nov. 20, 1968, 43/84954

U.S. Cl. 303—21 P **3 Claims**



The hydraulic braking circuit between the master cylinder and the wheel cylinder is provided with a valve for interrupting fluid communication therebetween and a movable member for selectively increasing and decreasing the effective volume of a portion of the hydraulic circuit. A sensor is provided for sensing the rotation of at least one of the wheels of the vehicle and delivering an instruction signal when the wheel is subjected to an excess braking beyond a predetermined deceleration of the wheel. The signal from the sensor operates a change-over valve which increases the effective volume of the portion of the hydraulic circuit by actuating the movable member. A detector is provided for detecting maximum deceleration of the wheel during braking and the maximum value of the detected wheel deceleration is preserved in a memory. The detected maximum wheel deceleration and the rate of change of the effective volume of the hydraulic circuit are converted into effective electric signals. An orifice valve controls the rate of effective volume reduction in the hydraulic circuit in response to a comparison of the electric signals.

3,656,818
SELF-DAMPED GUIDE RAIL

Vincent E. Bischoff, Rivergrove, and Paul S. Colecchi, Des Plaines, both of Ill., assignors to A. B. Dick Company, Chicago, Ill.

Filed May 8, 1970, Ser. No. 35,717

Int. Cl. F16c *29/00*

U.S. Cl. 308—3 **8 Claims**

A vibration resistant guide for an ink jet printing head that moves back and forth across a paper web, comprising a flat rail supported at opposite ends and having guideways extending along opposite edges to guide the printing head, the center of the rail having a recess in its under surface. A damping bar composed of a rubber matrix with lead shot embedded therein is disposed in the recess to damp out vibrations of the rail. The damping bar fits loosely within the recess, and is retained therein by a diaphragm that covers the recess.

3,656,819
AEROSTATIC OR HYDROSTATIC BEARING

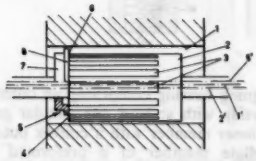
Gilles Gerardus Hirs, Pijnacker, Netherlands, assignor to Nederlandse Organisatie Voor Toegepast-Natuurwetenschappelijk Onderzoek Ten Behoeve Van Nijverheid, Handel En Verkeer, The Hague, Netherlands

Filed Aug. 21, 1970, Ser. No. 65,990

Claims priority, application Netherlands, Aug. 29, 1969, 6913284

Int. Cl. F16c *17/16*

U.S. Cl. 308—9 **7 Claims**



In an aerostatic or hydrostatic bearing a ring that is freely movable in the lubricant supply flow controls the lubricant distribution over the entry of the slit between the bearing members and amplifies the circumferential pressure differentiation occurring at eccentric positions of the bearing members. As a result the bearing's carrying capacity and stiffness are improved.

3,656,820
WEAR COMPENSATING SEAL

Pietro Pensa, Milan, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

Filed May 8, 1968, Ser. No. 727,425

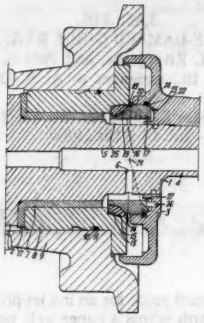
Claims priority, application Italy, May 20, 1967, 16335 A/67

Int. Cl. F16j *15/16;* **F16k** *41/00*

U.S. Cl. 308—36.1 **10 Claims**

A seal assembly for a bearing wherein two relatively rotatable annular matched members have planar face-to-face

sealing contact surfaces resiliently urged together and one of the members is mounted for limited spherical rocking move-

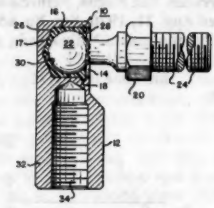


ment about a point on the sealing surface plane and on the axis of relative rotation between the members.

3,656,821
SELF-ALIGNING BEARING

Albert R. McCloskey, and Alfred Rozentals, both of Fairfield, Conn., assignors to Heim Universal Corporation, Fairfield, Conn.

Filed Aug. 5, 1970, Ser. No. 61,294
Int. Cl. F16c *23/04*
U.S. Cl. 308—72 **10 Claims**



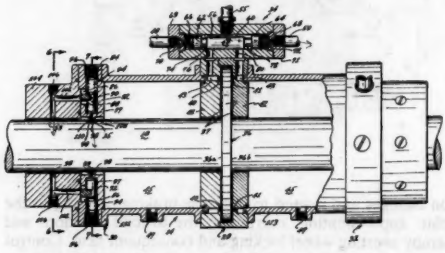
A self-aligning bearing comprising an outer member with an open portion with at least one annular groove disposed therein, an inner member with a convex outer surface, and an intermediate member of a preformed resilient, self-lubricating material, said intermediate member having at least one annular lip, said lip adapted to register with said annular groove in said outer member to mechanically restrain said intermediate member in place within said open portion of said outer member and to mechanically restrain said inner member in place within said intermediate member, said intermediate member, when in its assembled position, having a spherical inner surface generally conforming to the convex outer surface of said inner member.

3,656,822
SERVO-CONTROL GAS-LUBRICATED BEARING SYSTEM

Everett H. Schwartzman, 457 34th Street, Manhattan Beach, Calif.

Filed Sept. 13, 1968, Ser. No. 759,615
Int. Cl. F16c *1/24*
U.S. Cl. 308—122 **5 Claims**

A system is disclosed for supporting a rotary load on a cushion of gas that is developed in a gas-bearing structure. Both radial and thrust loads are carried in the system as disclosed, and similar principles are utilized in the operation of each such component structure. A closure member cooperates with a load member, carrying a rotary load, to define the space in which a gas cushion is developed. To preserve the space relationship between the load member and the closure member within operating limits, the two structures are position servo-controlled. As disclosed herein, signals are developed that are indicative of the relationship

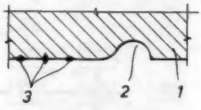


between the members thereby defining the chamber in which the gas cushion is provided. A servo-control structure receives those signals to control the flow of gas for preserving the desired positional relationship by applying impact or impinging gas forces. As disclosed, a plurality of opposing ports are provided to discharge gas, and thereby exert impact forces to preserve the bearing elements within operative relative positions.

3,656,823
SLIDABLE CARRIER OR SUPPORT

Wladimir Tiraspolsky, 69 Avenue Victor Cresson, 92 Issy-les-Moulineaux, and Pierre Leschiutta, Villa Pimpy-Impasse Gallego, 65 Tarbes, both of France

Filed Aug. 5, 1970, Ser. No. 61,055
Int. Cl. F16c *17/04*
U.S. Cl. 308—160 **15 Claims**



A thrust bearing has the working surface of a first element facing the working surface of a second element. The material forming the working surface of the first element is made of a harder material than that which forms the working surface of the second element. The working surface of the first element is grooved radially outwardly to the edge so the edges of the grooves will scrape abrasive material from the softer working surface of the softer surface, collect it in the grooves, and discharge it radially out the open ends of the grooves.

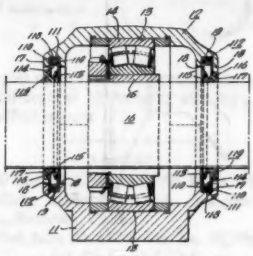
3,656,824
SEALING DEVICE IN BEARING HOUSINGS

Carl Woodrow Ullberg, Katrineholm, Sweden, assignor to Aktiebolaget Svenska Kullager-fabriken, Goteborg, Sweden

Filed Sept. 16, 1969, Ser. No. 858,294
Claims priority, application Sweden, Sept. 16, 1968, 12434/68
Int. Cl. F16j *15/32*
U.S. Cl. 308—187.1 **7 Claims**

A sealing device for bearing housing intended to carry a bearing and a rotatable shaft mounted therein, which housing is divided along a diametrical plane into two halves, charac-

terized thereby that the bore in the side walls of said bearing housing halves through which the shaft passes, is considerably greater than the shaft and internally provided with a ridge or a groove which seals against and acts as a fixing



device for the peripheral portion of a side washer which surrounds the shaft and forms a sealing device either alone, together with the shaft or together with another annular member which is arranged around the shaft.

3,656,825

ROLLER BEARINGS

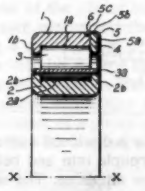
Werner Manger, Schweinfurt, Germany, assignor to SKF Kugellagerfabriken GmbH, Schweinfurt, Germany

Filed July 24, 1970, Ser. No. 57,972

Claims priority, application Germany, Aug. 1, 1969, G 69 30 530.2

Int. Cl. F16c *33/60*

U.S. Cl. 308—213 **6 Claims**



A roller bearing having an inner and outer race and a plurality of rollers located therebetween. One of the races is provided with a separable retaining shoulder. Connecting means comprising a cap extends over the shoulder and engages a circumferential groove provided in the periphery of the ring to thereby secure the shoulder thereto.

3,656,826

METHOD FOR THE PREPARATION AND HANDLING OF HIGHLY OXYGEN REACTANT MATERIALS

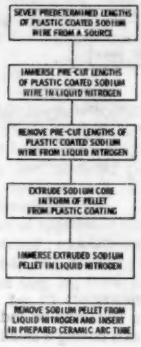
Hugh D. Fraser, West Caldwell, and Leo C. Werner, Cedar Grove, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 17, 1970, Ser. No. 55,822

Int. Cl. H01j *9/18*

U.S. Cl. 316—19 **3 Claims**

A method for the preparation and handling of predetermined quantity amounts of sodium or other highly oxygen reactant materials. The method comprises the steps of cutting a preselected length of the material from a source of the material disposed within protective plastic tubing of an indeterminate length and storing the precut lengths of tubing containing the material as a core in a container of liquid nitrogen. After suitable chilling in the liquid nitrogen the precut lengths of tubing are removed from the liquid nitrogen and the chilled core material is extruded from the plastic tubing and is reinserted into a liquid nitrogen bath for subsequent use as a predetermined quantity amount or dose of the material in handleable form.


SEVER PREDETERMINED LENGTHS OF PLASTIC COATED SODIUM WIRE FROM A SOURCE
IMMERSE PRE-CUT LENGTHS OF PLASTIC COATED SODIUM WIRE IN LIQUID NITROGEN
REMOVE PRE-CUT LENGTHS OF PLASTIC COATED SODIUM WIRE FROM LIQUID NITROGEN
EXTRUDE SODIUM CORE IN FORM OF PELLET FROM PLASTIC COATING
IMMERSE EXTRUDED SODIUM PELLET IN LIQUID NITROGEN
REMOVE SODIUM PELLET FROM LIQUID NITROGEN AND INSERT IN PREPARED CERAMIC ARC TUBE

3,656,827

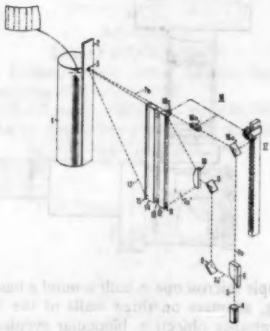
HOLOGRAPHIC READ/WRITE STORAGE SYSTEM

Rodger L. Gamblin, Vestal, N.Y., and Carl D. Southard, Raleigh, N.C., assignors to International Business Machines, Armonk, N.Y.

Filed Apr. 3, 1969, Ser. No. 813,198

Int. Cl. G02b *27/22*

U.S. Cl. 350—3.5 **2 Claims**



The invention relates to a holographic mass data storage system in which coded representations of data are recorded on the photosensitive surface of a drum sequentially under control of mechanical means, and means for reading the written information, by reflection onto an array of radially disposed photodetectors. An address control means is provided whereby the written information may be selectively read out in any desired combinations of words of information.

3,656,828

LIGHT SIGNAL APPARATUS

Karl Otto Ragnar Scholdstrom, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Dec. 17, 1969, Ser. No. 885,799

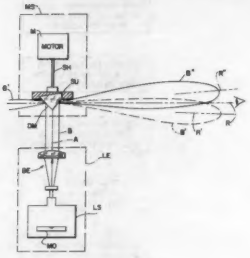
Claims priority, application Sweden, Jan. 24, 1969, 934/69

Int. Cl. G02b *17/00*

U.S. Cl. 350—7 **4 Claims**

A pair of oppositely directed beams of light are rotated about an axis. The direction of the beams has a small devia-

tion from a plane normal to the axis, whereby flashes of equal strength from both beams are produced in the normal plane at twice the frequency of revolution, thereby indicating



the normal plane to a viewer.

In similar manner, a line may be indicated by making a beam rotate about an axis having a small deviation from that of the beam.

3,656,829

ASSEMBLY FOR A STEREOSCOPIC MICROSCOPE

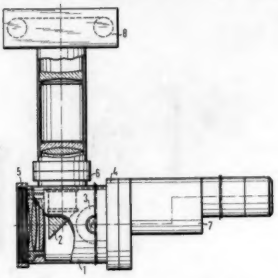
Karl-Heinz Wilms, Dachau, Germany, assignor to Optische Werke G. Rodenstock, Munich, Germany

Filed Apr. 15, 1970, Ser. No. 28,784

Claims priority, application Germany, Apr. 19, 1969, P 19 20 006.7

Int. Cl. G02b *23/00*

U.S. Cl. 350—33 **8 Claims**



A stereoscopic microscope is built around a basic unit having a housing, adapters on three walls of the housing for securing an entrance objective, binocular eyepieces, and an auxiliary unit, such as an illuminator or a camera, to the housing. A beam splitting mirror in the housing permits light to be transmitted between the auxiliary unit and the objective while light also is transmitted between the objective and the eyepieces. The magnification of the microscope can be changed by two Galilean telescopes reversibly mounted on a rotary carrier between the mirror and the eyepiece adapter.

3,656,830

REAR VIEW MIRROR WITH MOISTURE CONTROL

Gustav Kurschner, Fechenbach (Main), Germany, assignor to Fechenbacher Armaturen-Und Metallwaren-Fabrik, Fechenbach am Main, Germany

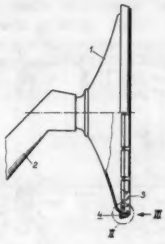
Filed Aug. 20, 1970, Ser. No. 65,379

Claims priority, application Germany, Aug. 20, 1969, G 69 32 782.8

Int. Cl. G02b

U.S. Cl. 350—67 **10 Claims**

In an external rear view mirror a cupped housing has an open side in which a mirror member is retained, with an annular sealing ring being interposed between the mirror member and the housing. The sealing ring has a main annular body portion and an axially adjacent annular sealing lip extending along the main annular body portion with both of them together having a circumferential edge face provided



with a plurality of circumferentially distributed at least substantially radial kerfs which extend through the radial thickness of the sealing lip but only partly through the radial thickness of the main body portion.

3,656,831

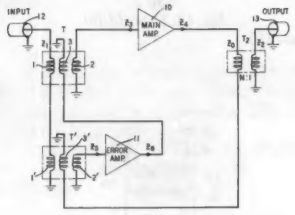
FEEDBACK AMPLIFIER

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 14, 1971, Ser. No. 106,510

Int. Cl. H03f *1/36*

U.S. Cl. 330—85 **6 Claims**



A feedback amplifier is disclosed wherein two trifilar transformers are used to couple into and between a main signal amplifier and an error amplifier. The signal source is connected in series with one winding in the main amplifier transformer and one winding of the error amplifier transformer. A second winding of each transformer is connected, respectively, to the input port of its associated amplifier, while the output from each amplifier is connected to the third winding of the other's transformer. Advantageously, the input impedances of the main amplifier and the error amplifier are much less than the driving source impedance, while their output impedances are much greater than the source and load impedances. This permits the use of small, simple coupling transformers having very few turns. As a consequence, the resulting feedback network is exceedingly broadband, and the feedback delay correspondingly small.

3,656,832

MICRO-OPTICAL IMAGING APPARATUS

Herbert Judin, Huntington, N.Y., assignor to Areoptix Technology Corporation, Plainview, Long Island, N.Y.

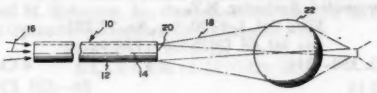
Continuation of application Ser. No. 727,384, Feb. 26, 1968, which is a division of application Ser. No. 419,512, Dec. 18, 1964, now Patent No. 3,379,832, dated Apr. 23, 1968. This application June 3, 1970, Ser. No. 41,763

Int. Cl. G02b *5/14*

U.S. Cl. 350—96 R **11 Claims**

A high speed, diffraction limited point or line forming optical system utilizing uncorrected and imperfect single element lenses which are substantially spherical, hemispherical or

cylindrical in shape, or appropriate index and size, in conjunction with radiation or light waves incident at limited



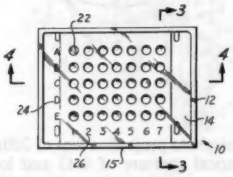
divergence angles upon said lens elements; by virtue of small optical path differences of focusing exit rays, a diffraction predominant effect occurs.

3,656,833

COMBINED PLASTIC-GLASS MICROSCOPE SLIDES

Clarence Wallace, Glendale, Calif., assignor to Medical Plastics, Inc., Burbank, Calif.

Filed June 29, 1970, Ser. No. 50,596
Int. Cl. G02b *21/34*
U.S. Cl. 350—95 **7 Claims**



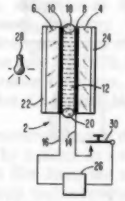
A microscope slide according to the present disclosure is provided for laboratory use. Its utility is widespread, a single example being in lymphocyte typing. The slide comprises a body constructed of a non-wettable material having aperture means extending between opposite planar surfaces. A glass plate is bonded to one of the planar surfaces so as to close one end of the aperture means and thereby to form cavity means for confining a specimen to a restricted area. The glass plate provides a wettable surface in the cavity means for the specimen so that the specimen may spread on the glass plate in the cavity means. The device thereby provides the manufacturing convenience of a plastic-molded product with the essential feature of a wettable glass slide.

3,656,834

ADDITIVE FOR LIQUID CRYSTAL MATERIAL

Ivan Haller, Chappaqua, and Harold A. Huggins, White Plains, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 9, 1970, Ser. No. 96,369
Int. Cl. G02f *1/16*
U.S. Cl. 350—150 **10 Claims**



A nematic liquid crystal material which assumes a homeotropic texture is provided by dissolving an additive material having the formula

$$RR_3'N^+X^-$$

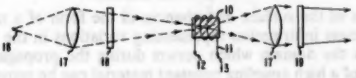
wherein R is an alkyl radical having 10 to 24 carbon atoms, R′ is a methyl or ethyl radical, and X^- is an anion derived from a simple acid, in a nematic material. A typical example of the additive is hexadecyltrimethylammonium bromide. The homeotropic texture provided by this composition, when placed between two conducting transparent plates, is readily deformed by a voltage applied to the plates and can thereby be utilized to control the transmission of light.

3,656,835

MODULATION BY A MAGNETIC FIELD OF ELECTROMAGNETIC RADIATION PRODUCED BY THE DECAY OF TRIPLET STATES

Robert C. Johnson, and Richard E. Merrifield, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 724,420, Apr. 26, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 648,883, June 26, 1967, now abandoned. This application Aug. 26, 1969, Ser. No. 853,183
Int. Cl. G02f *1/16*
U.S. Cl. 350—160 **16 Claims**



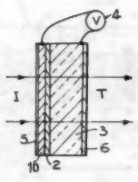
This disclosure describes a process and devices for modulating electromagnetic radiation, e.g., visible light, by means of variation in a magnetic field on a substance, e.g., anthracene, pyrene, diphenylanthracene, etc., in which triplets can be created, with the triplets subsequently decaying and thereby causing said substance to emit electromagnetic radiation, e.g., to fluoresce.

3,656,836

LIGHT MODULATOR

Baudoin de Cremoux, and Pierre Leclerc, both of Paris, France, assignors to Thomson-CSF

Filed June 26, 1969, Ser. No. 836,783
Claims priority, application France, July 5, 1968, 158042
Int. Cl. G02f *1/36;* **H01s** *3/00*
U.S. Cl. 350—160 **10 Claims**



The application of a voltage between the semiconductor and the conducting layers of a structure wherein said layers are separated by an insulator layer allow the modulation of a luminous radiation propagating through or reflected on said structure.

3,656,837

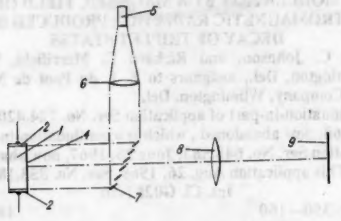
SOLID STATE SCANNING BY DETECTING THE RELIEF PROFILE OF A SEMICONDUCTOR BODY

Carl Peter Sandbank, Bishop's Stortford, England, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 14, 1970, Ser. No. 80,616
Claims priority, application Great Britain, Oct. 21, 1969, 51,474/69
Int. Cl. G02f *1/28*
U.S. Cl. 350—161 **8 Claims**

A solid state scanning system includes a body of semiconductive material, such as cadmium sulfide, which exhibits

moving high field instability effects, and a light projection system having Schlieren optics to detect surface disturbances caused by a propagating high field domain nucleated within the semiconductor body. The light is preferably directed onto the semiconductor surface by a plurality of louvered mirror strips which also detect the light reflections therefrom. The system may also include a display means to show the relief



profile of the surface disturbances in the form of a raster of brightness information representing variations in the voltage across the domain which occurs during the propagation. A layer of a high coupling constant material can be provided on the device to enhance the disturbance effect. A liquid or plastic film can also be used on the device to introduce memory in the system.

3,656,838

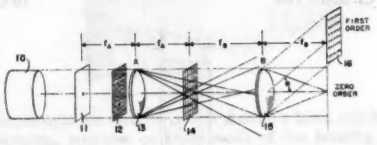
METHOD FOR MAKING AN OPTICAL FILTER FOR A CHARACTER IDENTIFICATION SYSTEM

John F. Bryant, Lemon Grove, and Will T. Hyde, Jr., San Diego, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy

Original application Nov. 12, 1968, Ser. No. 774,737, now Patent No. 3,571,603. Divided and this application Sept. 4, 1970, Ser. No. 69,678

Int. Cl. G02b *5/18*

U.S. Cl. 350—162 SF **6 Claims**



A source of collimated coherent light is arranged to impinge upon a character to be identified and a two-dimensional diffraction means is positioned in the path of the collimated light passing through the character to be identified, forming a plurality of spatially disposed diffraction patterns. Appropriate optical means of a determinable focal length is positioned one focal length from the position of the character to be identified, forming far-field images of the plurality of diffraction patterns. A filter has a plurality of spaced discrete areas each defining the distinctive diffraction pattern of a known character by holographic techniques. Optical means integrates the light passing through the filter, diverting it to a first order, off-beam position. A plurality of light-responsive means, disposed in the first order off-beam position, and each related to a discrete area of the optical filter produces a signal in response to a predetermined amplitude of light passing through the filter, therefore identifying the character which was initially exposed to the source of collimated coherent light.

3,656,839

PROJECTION LENS OF HIGH NUMERICAL APERTURE

Patrick A. Trotta, Penfield, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 1, 1970, Ser. No. 77,271

Int. Cl. G02b *9/64, 13/04*

U.S. Cl. 350—214 **4 Claims**

A reversed telephoto projection lens of 200x magnification having a numerical aperture of 0.45 and long back focus comprises two groups, a three-element negative group spaced from a seven-element positive group by a factor of substantially 6.5x the focal length of the lens, being intended for use in a system with a plano-parallel cover glass.

3,656,840

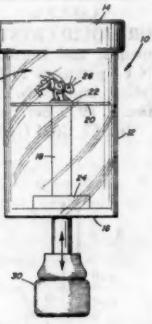
MAGNIFYING SPECIMEN VIEWER

William G. Smith, Lutherville, and Elias S. Friant, Jr., Baltimore, both of Md., assignors to Kimtec Incorporated, Towson, Md.

Filed June 26, 1970, Ser. No. 50,259

Int. Cl. G02b *27/02*

U.S. Cl. 350—239 **7 Claims**

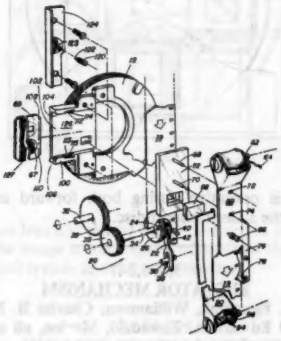


A container for housing a specimen to be studied. A specimen, such as an insect, is mounted on a disk. The disk, acting as a piston, is mounted on a shaft having a knob on the opposite end thereof. The shaft extends through the bottom of a housing and the disk slides, as a piston, within the housing. The top of the housing is a lens element. The distance between the lens element and the specimen to be observed is controlled by positioning the piston within the housing by means of the knob resting outside the housing.

3,656,841
CINEMATOGRAPHIC CAMERA WITH QUICK-CONVERT COLOR-ENCODING FILTER

Russell M. Heinonen, Jr., Hudson, Mass., assignor to Technical Operations Incorporated, Burlington, Mass.

Filed Apr. 3, 1970, Ser. No. 25,404
Int. Cl. G03b 19/18; G02b 5/22
U.S. Cl. 352—45 11 Claims



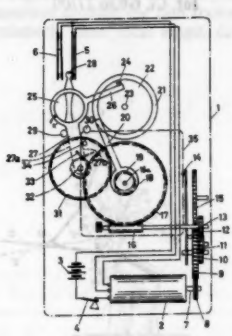
This disclosure depicts a number of cine cameras illustrating principles, uses, implementations, and modes of operation of the invention. Each disclosed embodiment includes a removable holder for supporting two alternatively operative light-affecting elements. At least one of the elements is a spectral zonal filter for encoding color information such that it may be recorded on black-and-white recording materials. In the illustrated preferred embodiments the other element constitutes a neutral glass slip having substantially the same optical retardation as the color-encoding filter. A guide structure is provided for guiding the holder through the camera housing from a withdrawn position to an inserted position wherein one of the light-affecting elements is in an operative position on the optical axis. The holder is designed such that it may be quickly withdrawn from the camera, altered in orientation, and reinserted into the camera to convert between conventional black-and-white photography wherein the neutral element is on axis and nonconventional color storage black-and-white photography wherein the color encoding filter is on axis.

3,656,842
MOTION PICTURE CAMERA

Anton Theer, Munich, and Johann Zanner, Unterhaching, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation of application Ser. No. 699,691, Jan. 22, 1968. This application July 29, 1970, Ser. No. 64,102
Claims priority, application Germany, Jan. 26, 1967, A 54723
Int. Cl. G03b 21/36
U.S. Cl. 352—91 12 Claims

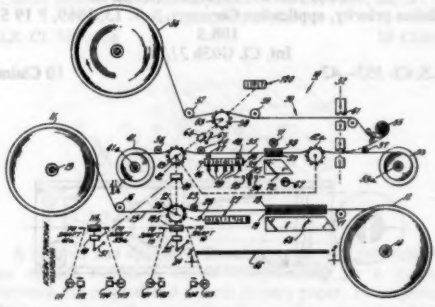
A motion picture camera wherein the supply reel need not or cannot be rotated by a motor in a sense to collect exposed film by drawing such film from the takeup reel. The motor which drives the takeup reel is reversible so that the takeup reel can be rotated in forward direction in order to draw unexposed film from the supply reel and also in reverse direction to pay out the film, for example, when the photographer wishes to reexpose a certain length of motion picture film. An arresting device which is controlled by a lever serving to set the motor for operation in forward or reverse is actuated when the motor is set for operation in reverse to arrest the drive for the takeup reel when the latter pays out a predetermined length of film. The film frame counter is arranged to prevent the lever from setting the motor for operation in reverse when a fresh film is inserted into the housing of the camera to thus prevent separation of film from the takeup reel.



3,656,843
FILM MATCHING APPARATUS

Michael Misch, East Mount Airy Road, Croton on Hudson, N.Y.

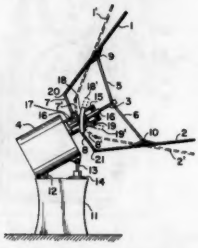
Filed Nov. 17, 1970, Ser. No. 90,386
Int. Cl. G03b 21/00
U.S. Cl. 352—129 7 Claims



Apparatus for matching motion picture film is constructed with individual transport means for the edited work film, the original film, and black leader film. Clutches are operable to couple selected ones of the transport means for coordinated movement of two or three of the film strips as required. Magnified images of selected portions of the films appear at a viewing station, which also contains footage and edge number counters for the work and original films, respectively.

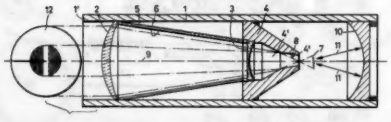
When a desired scene is being taken from the camera original, an equal length of black leader film is also cut. Both are fed to a holding container that is constructed with spiral guide grooves to coil these films, with adjacent coils being spaced from each other.

3,656,844
SUN FOLLOWING DEVICE
Ivan Botskor, Breisgan, Germany, assignor to Tibor Horvath and George Kalnay, a part interest to each
Filed June 26, 1969, Ser. No. 836,917
Int. Cl. G03b *21/00*
U.S. Cl. 353—3 **9 Claims**



A heliostat has an axle parallel to the earth's axis which is driven to revolve once each 48 hours, the axle having two oppositely disposed mirrors mounted thereon to each reflect the sun's light on alternate days, the mirrors being automatically adjusted to compensate for the declination of the sun by means of gears and a cam driven by the rotation of the axle.

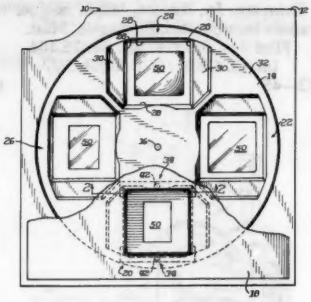
3,656,845
LIGHT-POINT-PROJECTOR
Ernst Koch-Bossard, Moosstrasse 11, CH6000 Luzerne, and Max August Pietsch-Faber, Im Klasterhof, CH8598 Bottighogen, Thugau, both of Switzerland
Filed Jan. 23, 1970, Ser. No. 5,318
Claims priority, application Germany, Nov. 13, 1969, P 19 57 108.5
Int. Cl. G03b *21/00*
U.S. Cl. 353—42 **10 Claims**



Aiming projector for attachment to a gun, or the like, for assisting in aiming thereof by providing, from a single light source, a projected bright spot indicating the point of aim and generalized illumination of the area of aim to a lower intensity.

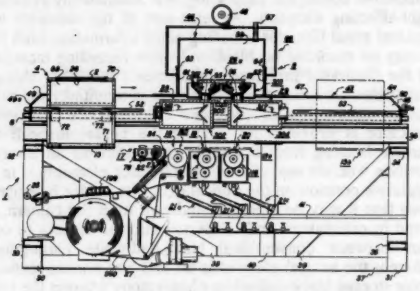
3,656,846
SLIDE METERING MECHANISM
John W. Hipelius, Skokie, and James H. Murray, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Dec. 30, 1969, Ser. No. 889,213
Int. Cl. G03b *23/00, 23/02*
U.S. Cl. 353—104 **3 Claims**

This invention presents a mechanism for metering a single slide from a supply into a slide transport disc that moves the slide through operative stations in a projector. The metering



mechanism is operative during both forward and reverse rotations of the slide transport disc.

3,656,847
ELEVATOR MECHANISM
Raymond K. Egnaczak, Williamson; Charles H. Myers, Palmyra, and Edward A. Zawadzki, Marion, all of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Nov. 14, 1969, Ser. No. 876,979
Int. Cl. B01k *5/00*
U.S. Cl. 355—3 **3 Claims**

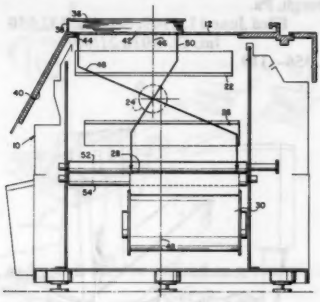


A lift mechanism is used for moving a work piece between operation and idle positions. The work piece is mounted on a platform which is slidably fit within a support structure. The platform is moved by the operation of a cam and cam follower in turn driven by a pneumatic cylinder. The potential energy of the work piece and platform is used to move the work piece to one of the desired positions. The work piece is a roller electrode raised into contact with a moving flat plate electrode. The two electrodes are used in a photoelectrophoretic imaging system to form and transfer an image.

3,656,848
NON-ALIGNED IMAGE OPTICAL SYSTEM FOR AN ELECTROSTATIC COPY MACHINE
Louis Bentzman, Levittown, Pa., assignor to Electrocopy Corporation, Philadelphia, Pa.
Filed Mar. 13, 1970, Ser. No. 19,273
Int. Cl. G03g *15/04*
U.S. Cl. 355—8 **4 Claims**

A non-aligned image in an optical system for use in an electrostatic copy machine including an upper mirror angularly disposed from the horizontal orientation of the machine and a lower mirror angularly disposed from the horizontal

orientation of the machine and a combination lens and mirror positioned in the light path between the upper mirror and the lower mirror, the said upper and lower mirrors and the



combination lens and mirror being centered in an optical axis in which the image is transversely offset from the central axis of the optical system and the copy machine.

3,656,849

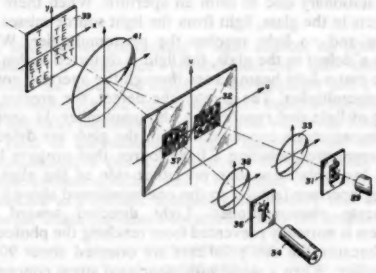
MULTIPLE IMAGE SYSTEMS

Sun Lu, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Original application Feb. 20, 1967, Ser. No. 617,349, now Patent No. 3,529,887, dated Sept. 22, 1970. Divided and this application May 15, 1970, Ser. No. 37,793

Int. Cl. G02b *27/22*

U.S. Cl. 355—46 **1 Claim**



A multiple image pattern is found from a single image master illuminated by a source of monochromatic light by establishing the Fourier transform of the light disturbance at the master image on a Fourier transform hologram of an array of points corresponding with the array of images to be formed, and establishing the Fourier transform of the light disturbance at the hologram on a light sensitive source.

3,656,850

PHOTOGRAPHIC PRINTING APPARATUS

John N. Harman, Jr., La Canada, Calif., assignor to Drewry Photocolor Corporation, Burbank, Calif.

Filed June 1, 1970, Ser. No. 41,979

Int. Cl. G03b *27/44*

U.S. Cl. 355—46 **6 Claims**

Photographic printing apparatus for printing a relatively large print and one or more relatively small prints of a single negative and of a predetermined size ratio in side-by-side relationship on a print paper. The apparatus includes a film carrier and a print paper support. A relatively short focal length lens device is provided for receiving light transmitted through the frame of a film carried on the film carrier and focusing it on print paper positioned on the print paper support to form a relatively large image for printing the relatively large print. Light re-directing means is provided for receiving light transmitted through the film frame and directing it around the relatively short focal length device and one or

more relatively long focal length lens devices are provided for receiving such light and focusing it on the print paper to form one or more relatively small images adjacent the relatively large image to print the relatively small prints and to thereby enable the relatively large and relatively small prints to be printed side-by-side on the print paper to conserve print paper and minimize the amount of print paper trimming required.

3,656,851

COPYING APPARATUS

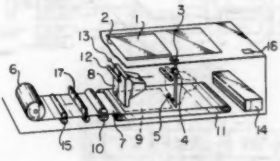
Shunichiro Kakii, and Akira Saito, both of Tokyo, Japan, assignors to Iwatsu Electric Company Limited, Tokyo, Japan

Filed Mar. 4, 1970, Ser. No. 16,391

Claims priority, application Japan, Mar. 10, 1969, 44/18173

Int. Cl. G03b *27/70*

U.S. Cl. 355—66 **10 Claims**



A method and apparatus for copying an original including an optical exposure device reciprocating in a passage between the original and a sheet of copy paper. The exposure device moves in the same direction as the copy paper being supplied and starts from a fixed standard line to move to a stop line that varies with the length of the original to thereby determine and cut the length of the copy paper to be the same length as the original. The exposure device then returns to its starting position while scanning an image on the original.

3,656,852

APPARATUS FOR BRINGING TWO FILMS INTO INTIMATE CONTACT WITH EACH OTHER

Robert F. Oetting, North Hollywood, Calif., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

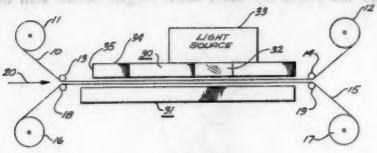
Filed June 15, 1970, Ser. No. 46,303

Int. Cl. G03b *27/20*

U.S. Cl. 355—91 **5 Claims**

Two lengths of film are gradually forced into intimate contact from their centers outwardly to their edges and then held

in intimate, non-slipping contact from edge to edge while the information stored on one of the films is transferred to the other film. The films are transported between two adjacent, spaced platens adapted to form cushions of air that force the films together. One of the platens is shaped to converge in



the region where the films initially pass between the platens. Preferably, the converging platen has an apex that is aligned with the centers of the films. In one embodiment, the platen is a trough having converging sides at one end. In another embodiment, the platen is a microporous material through which air is forced.

3,656,853

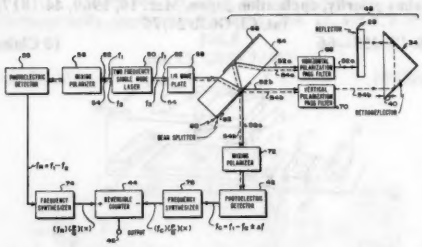
INTERFEROMETRIC SYSTEM

Alan S. Bagley, Los Altos Hills, Calif.; Leonard S. Cutler, Topsfield, Mass., and Joseph F. Rando, Oakland, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Original application Nov. 7, 1966, Ser. No. 592,589, now Patent No. 3,458,259. Divided and this application Mar. 10, 1969, Ser. No. 805,662. The portion of the term of this patent subsequent to July 29, 1986, has been disclaimed.

Int. Cl. G01b *9/02*

U.S. Cl. 356—106 **1 Claim**



A portion of a first laser light beam of one optical frequency and a portion of a second laser light beam of a different optical frequency are mixed by a photoelectric device to produce an electrical reference signal having a countable intermediate frequency. Another portion of the first laser light beam traverses a fixed length optical path of an interferometer, and another portion of the second laser light beam traverses a variable length optical path of the interferometer. These other portions of the first and second laser light beams are mixed by another photoelectric device to produce an electrical information signal having the same countable intermediate frequency as the reference signal only while the optical length of the variable length optical path is not being changed. A reversible counter integrates the difference in frequency between the reference and information signals while the optical length of the variable length optical path is being changed to indicate the change in length of the variable length optical path.

3,656,854

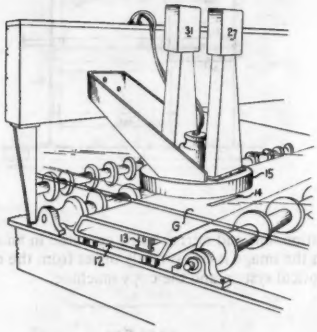
GLASS DEFECT DETECTION SYSTEM

Jack A. Bricker, Tarentum, and Hugh E. Shaw, Jr., New Kensington, both of Pa., assignors to PPG Industries Inc., Pittsburgh, Pa.

Filed June 11, 1969, Ser. No. 832,050

Int. Cl. G01n *21/40*

U.S. Cl. 356—119 **7 Claims**



A glass-defect detection system comprising a light source, a stationary disc, a scanning disc and a photomultiplier. A light beam is transmitted from the light source through the piece of glass being tested. The scanning disc is rotated by a motor so that slots on the scanning disc are aligned with slots on the stationary disc to form an aperture. When there are no defects in the glass, light from the light source misses the aperture and no light reaches the photomultiplier. When there is a defect in the glass, the light is distorted within the glass so that a light beam passes through the aperture and to the photomultiplier. The greater the defect, the greater the amount of light that reaches the photomultiplier. In another embodiment, stress concentrations in the glass are detected by an apparatus including a light source that projects light toward two polarizers (one on either side of the glass), a scanning aperture (similar to the one mentioned above) and a separate photomultiplier. Light directed toward the polarizers is normally prevented from reaching the photomultiplier because the two polarizers are oriented about 90° to one another. When a stone with associated stress concentrations is present in the glass, light is transmitted through the polarizers to the scanning aperture and the photomultiplier receives a pulse of light.

3,656,855

OPTICAL POSITION DETECTOR

Webber I. Collart, Rocky River, and Tom L. Galanis, Mentor, both of Ohio, assignors to Harvey Hubbell Incorporated, Bridgeport, Conn.

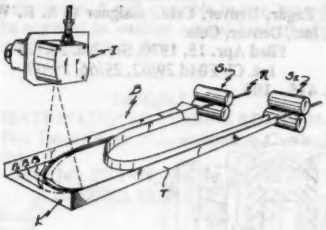
Filed Mar. 23, 1970, Ser. No. 21,875

Int. Cl. G01b *11/00*

U.S. Cl. 356—167 **6 Claims**

An optical position detector for monitoring the position of a radiating hot object such as a metallic heat emitting hot bar and/or rod product in a metal rolling mill, the monitoring detector including a scanning head having a rotating lens system that is focused on a heat sensitive photocell and which scans the position occupied by the hot object and develops a detection signal that is proportional to said occupied position. The sensing head also produces a reference signal. The reference signal and object detection signal are

phase related so as to generate an analog signal which is then representative of the detected position of the object being

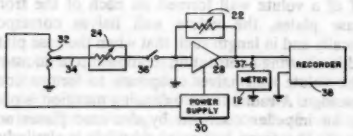


monitored, and which may be utilized as a control signal in the rolling mill.

3,656,856
COLORIMETER

George M. Katz, Leonia, N.J., and Arthur L. Levy, Mount Vernon, N.Y., assignors to Scientific Specialties Ltd., Garden City, N.Y.

Filed Mar. 16, 1970, Ser. No. 19,875
Int. Cl. G01n *21/22*
U.S. Cl. 356—206 27 Claims



A colorimeter comprising a light source, an operational amplifier, a reference photoconductive cell connected between the input and output of the amplifier and a sample photoconductive cell connected to the input of the amplifier. The amplifier provides an output signal which is a function of the ratio of the amount of light falling on the reference photoconductive cell to the amount of light falling on the saMple photoconductive cell. The output of the amplifier is connected to a suitable measuring device such as a meter or recorder which provides a measurement of the output signal.

3,656,857
A BALL POINT PEN INK RESERVOIR CONTAINING AN IMPROVED INK FOLLOWER

Daniel W. Seregely, Los Angeles, Calif., assignor to The Gillette Company, Boston, Mass.

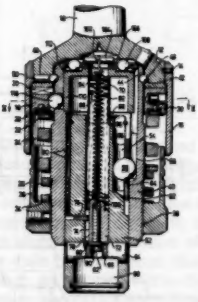
Original application Oct. 18, 1967, Ser. No. 676,244, now Patent No. 3,526,522, dated Sept. 1, 1970. Divided and this application Dec. 2, 1969, Ser. No. 881,399
Int. Cl. B43K *7/08*; B43k *7/10*
U.S. Cl. 401—142 4 Claims

A large diameter ball point pen ink reservoir having a large diameter elongated tubular casing, one end of said tubular casing being open to the atmosphere, a column of viscous ink contained in said reservoir, and a plug of ink follower composition in said reservoir and in contact with the end of said column of viscous ink nearest the atmosphere, said ink follower composition being stable for a prolonged time under a wide range of temperatures and humidity, non-drying, non-reactive and immiscible with various inks and effective to prevent back leakage of ink from a reservoir, said ink follower composition including a liquid vehicle containing a uniformly suspended dispersion of a solid polymer in the form of microscopic, almost colloidal, particles, the size of such particles being such that the resulting composition is translucent and the amount of said solid polymer being sufficient to give the viscous ink follower composition an ASTM worked penetration of 250 to 500 at 77° F.

3,656,858
SCREW THREAD CUTTING APPARATUS

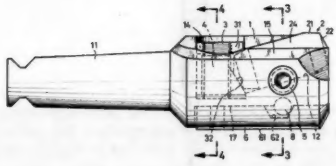
Alf A. A. Eriksson, Nacka, Sweden, assignor to Aktiebolaget Svenska Precisionsverktyg, Nacka, Sweden

Filed Dec. 3, 1969, Ser. No. 881,683
Claims priority, application Sweden, Dec. 16, 1968, 17220/68
Int. Cl. B23g *1/00, 5/14*
U.S. Cl. 408—139 2 Claims



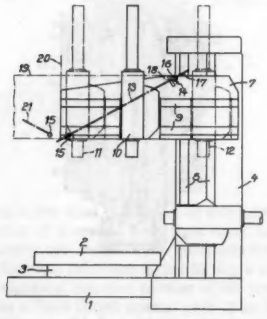
In this apparatus the driving and driven parts are mounted for axial movement relative to one another, but are held resiliently in axial positions of rest by compression and tension springs, respectively. The compression spring is mounted in the driven part between a sleeve reciprocably mounted on the inner end of the driven part, and a plug adjustably threaded in the outer end of the driven part, so that by inserting a tool into the outer end of the driven part, the plug can be adjusted to vary the tension in the compression spring. The tension spring is also attached at one end to this plug so that its tension is adjusted simultaneously with that of the compression spring.

3,656,859
REAMER WITH REVERSIBLE BLADE
Erich Rietzler, Sigmaringen, and Dieter Kress, Aalen, both of Germany, assignors to Mapal Dr. Kress KG, Aalen, Germany
Filed Aug. 24, 1970, Ser. No. 66,550
Claims priority, application Germany, Aug. 23, 1969, P 19 42 955.1
Int. Cl. B23d 77/04
U.S. Cl. 408—179 7 Claims



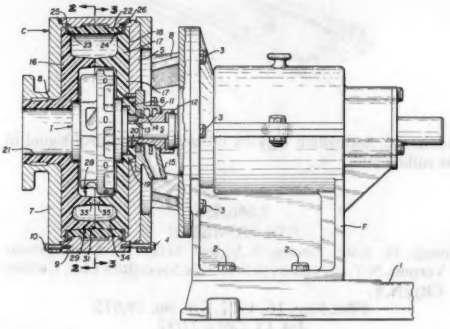
A cutter head for a reamer carrying a reversible blade having multiple cutting edges, the blade being adjusted both in the direction of the axis of rotation and radially thereto by abutting engagement of an inactive cutting edge with a cam face on a sleeve which is adjusted radially in a bore of the cutter head.

3,656,860
DEVICE FOR CORRECTING BENDING OF A HORIZONTAL MACHINE-TOOL SUPPORT ELEMENT
Marcel Neuman, Collonges-au-Mont D'Or, France, assignor to C.H.M.P. Berthiez, Paris, France
Filed Nov. 12, 1969, Ser. No. 875,756
Claims priority, application France, Nov. 25, 1968, 175203
Int. Cl. B23c 1/00
U.S. Cl. 408—234 7 Claims



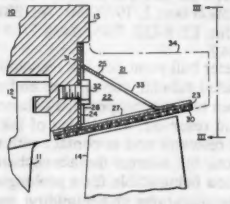
Vertical bending stresses in machine tools having a column and a horizontal support element, such as an arm cantilevered off the column or a cross bar extending between two vertical columns, are corrected by providing at least one tie-rod disposed in the vertical plane of the support element, one end of the tie-rod being secured adjacent the lowermost surface of the support element and the other end of the tie-rod being adjacent the uppermost surface of the support element, the tie-rod thus being obliquely disposed to the column.

3,656,861
CENTRIFUGAL PUMP WITH MATING CASE PLATE VOLUTE HALVES AND CONSTANT SECTION IMPELLER
Irvin F. Zagar, Denver, Colo., assignor to A. R. Wilfley and Sons, Inc., Denver, Colo.
Filed Apr. 15, 1970, Ser. No. 28,735
Int. Cl. F04d 29/02, 29/66, 29/00
U.S. Cl. 415—109 9 Claims



A centrifugal pump having front and back case plates with one-half of a volute wall formed on each of the front and back case plates, the volute wall halves corresponding diametrically and in length such that when the case plates are disposed in abutting confronting relationship in an assembled pump the volute wall halves cooperate to form a complete volute passage. A radial force balancing partition is provided between an impeller confined by the case plates and the volute wall. The force balancing partition is similarly comprised of identical mating halves formed on the front and back case plates. The case plates house or confine an impeller having a constant wall thickness or cross-section throughout to substantially eliminate thermal shock in the impeller. The impeller includes recesses or cut-out areas in the opposite faces thereof to yield substantially greater hydraulic performance while at the same time reducing wear caused by abrasion.

3,656,862
SEGMENTED SEAL ASSEMBLY
Thomas J. Rahaim, Claymont, and George M. Mierley, Sr., Wilmington, both of Del., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 2, 1970, Ser. No. 51,970
Int. Cl. F01d 11/08; F04d 29/08
U.S. Cl. 415—171 5 Claims



A light weight seal assembly divided into arcuate segments surrounds the tips of an annular row of rotating blades of an axial flow gas turbine. Each segment comprises formed sheet metal members brazed together and attached to the blade

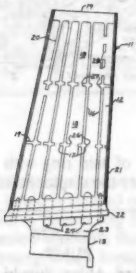
ring in the turbine casing. Leakage through expansion gaps between segments is prevented by sealing strips which bridge the gaps. Heat is transferred from the light weight seal structure into the relatively massive blade ring which is cooled by an external air supply. A soft wearable liner is brazed to the inside of the segment to insulate against heat transfer from the gas stream into the blade ring.

3,656,863

TRANSPIRATION COOLED TURBINE ROTOR BLADE

Angelo De Feo, Totowa Boro, N.J., assignor to Curtiss-Wright Corporation

Filed July 27, 1970, Ser. No. 58,478
Int. Cl. F01d *5/18*
U.S. Cl. 416—97 **3 Claims**



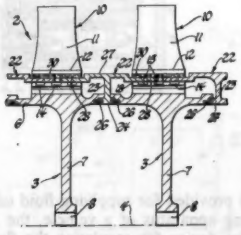
A transpiration cooled turbine rotor blade, having a solid strut with spanwise and chordwise lands on the surface, thereof, and a porous sheath attached to the lands, and having provision for metering desired amounts of cooling air to selected portions of the blade surface in view of the centrifugal pumping action of the blade.

3,656,864

TURBOMACHINE ROTOR

Joseph A. Wagle, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1970, Ser. No. 87,769
Int. Cl. F01d *5/30*
U.S. Cl. 416—190 **7 Claims**



A rotor for a compressor or turbine of the axial-flow type in which the rotor wheels or drum sections have blade stalks integral with them and the blades, including blade platforms, are mounted on the stalks by circumferentially extending dovetail structure. A spacer ring between adjacent rotor wheels includes fingers extending under the blade platforms which may hold the blades in place on the stalks and which may bear vibration damping material in contact with the blade platforms. A ring of such blades engaging in dovetails in plural axially aligned drum sections may hold these assembled together.

3,656,865

ROTOR BLADE RETAINER

Esten W. Spears, Jr., assignor to General Motors Corporation, Detroit, Mich.

Filed July 21, 1970, Ser. No. 56,763
Int. Cl. F01d *5/32*
U.S. Cl. 416—221 **4 Claims**

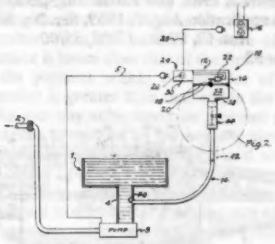
A compressor rotor wheel has blade slots extending across the rim. The blades are retained in the slots by a ring of retaining plates disposed in an undercut groove in the face of the rim and having tabs which locate the retainers against circumferential movement and tabs which are deformable to abut the next adjacent plate or deformable to remove the plate for blade removal.

3,656,866

DRAIN PUMP CONTROL

Wilbur H. Hine, Jr.; Ronald D. Murray, and Richard E. Lang, all of Hamburg, N.Y., assignors to said Hine and said Murray, by said Lang

Filed May 11, 1970, Ser. No. 36,095
Int. Cl. F04b *49/06*
U.S. Cl. 417—38 **4 Claims**



A control for preventing cavitation and cycling of electrically operated pumps employed for emptying sink drains or the like. The pump operation control includes a diaphragm operated device responsive to fluctuations in air pressure and a conduit for connecting the device to a drain pipe from which water is to draw upon operation of the pump. When water rises in the drain pipe to a point above the level of the inlet to the conduit, air trapped within the conduit is compressed by the water; the device upon sensing an increase in pressure within the conduit serving to effect energization of the pump.

3,656,867

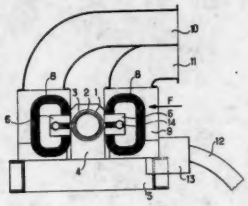
ELECTROMAGNETIC PUMP FOR LIQUID METALS

Henri Carbonnel, Anthony, and Jean Le Frere, Villejuif, both of France, assignors to Groupement Atomique Alsacienne Atlantique, Plessis Robinson, France

Filed July 15, 1970, Ser. No. 54,946
Claims priority, application France, July 16, 1969, 6924241
Int. Cl. H02n *4/20;* **H02k** *45/00;* **G21d** *7/02;* **H02k** *1/12*
U.S. Cl. 417—50 **3 Claims**

An electromagnetic pump comprising an impelling duct for liquid metals having a symmetry axis, made of a refractory

material and equipped with preheating means and thermal insulation, a stator consisting of two magnetic yokes arranged on both sides of the duct and comprising laminated cores in parallel relation to a plane containing the axis of the duct and



having deep and uniformly spaced slots, each of which receives a flat coil in a direction perpendicular to the axis of the duct. In this manner, each of the coils can be removed by translation in a direction parallel to the axis of the duct after unclamping in a perpendicular direction.

3,656,868

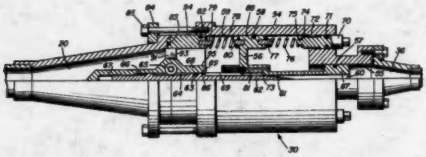
METHOD OF PUMPING FLUIDS WITH AN ENERGY WAVE GENERATOR

Clarence W. Brandon, Tulsa, Okla., assignor to Orpha B. Brandon, Nashville, Tenn., a part interest

Original application Dec. 1, 1967, Ser. No. 687,402, now Patent No. 3,473,344, which is a continuation of application Ser. No. 477,869, Aug. 6, 1965, now abandoned, which is a continuation-in-part of application Ser. No. 665,995, June 17, 1957, now Patent No. 3,302,720, and a continuation-in-part of 149,953, Nov. 3, 1961, now Patent No. 3,255,601. Divided and this application Aug. 7, 1969, Ser. No. 848,313

Int. Cl. F04b , *17/00, 35/00*

U.S. Cl. 417—53 **8 Claims**



A method of pumping fluids from lower pressures to higher pressures by means of an energy wave generator wherein the rarefactions of energy waves in the higher pressured fluid are an assisting means in the transfer of fluids from the lower pressure fluids, and wherein the wave generator has substantially equal pressure area relationships between the higher and lower pressures of fluids.

3,656,869

VARIABLE DISPLACEMENT HYDRAULIC PUMP

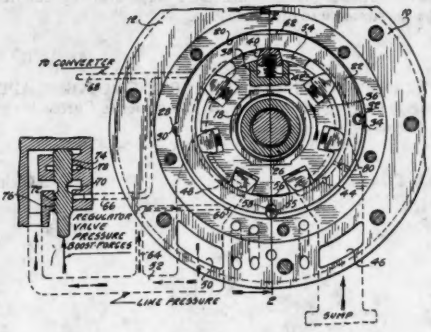
Allan S. Leonard, Westland, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 2, 1970, Ser. No. 24,985

Int. Cl. F04b *49/00*

U.S. Cl. 417—220 **8 Claims**

A variable-capacity, positive displacement pump having a rotor, pumping vanes or slippers carried by said rotor, a cam ring surrounding said rotor and cooperation therewith to define pumping chambers, a pump body surrounding said cam ring and connected thereto with a pivotal connection whereby the pump body and the cam ring define opposed pressure chambers, and regulator valve means for controlling the pressures distributed to each of said pressure chambers



whereby the position of said ring with respect to said rotor may be changed to vary the displacement of the pump.

3,656,870

PUMP

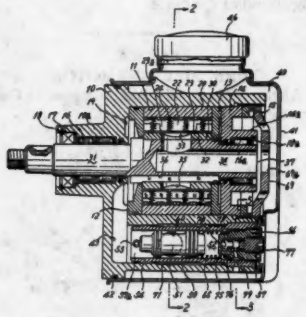
Takeshi Kusakabe, and Akira Suzuki, both of Kariya-shi, Japan, assignors to Toyoda Roki Kabushiki Kaisha

Filed Jan. 26, 1970, Ser. No. 5,461

Claims priority, application Japan, Jan. 29, 1969, 44/6568

Int. Cl. F04b *49/00*

U.S. Cl. 417—300 **4 Claims**



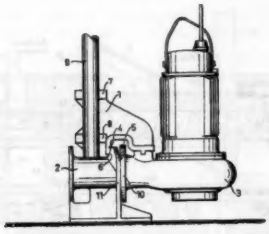
A pump is provided for supplying fluid under pressure to power steering apparatus of a vehicle, the pump equipped with a control device for regulating the flow rate and the pressure of delivery fluid, such the control device comprising the combination of flow and pressure control valves which sets the flow rate and the maximum pressure of delivery fluid at most preferable values for the power steering apparatus. A drive shaft is rotatably mounted in a casing member and is provided with a concentric suction channel and a discharge channel in the outer peripheral surface thereof; the shaft carrying an eccentric rotor thereon forms a crescent-shaped clearance between the rotor and the casing member, and a plurality of abutments are loosely received in radial grooves circumferentially disposed with uniform spacing in the inner peripheral surface of the casing member.

3,656,871

PUMP UNIT

Konrad Valdemar Carlsson, Solna, Sweden, assignor to Stenberg-Flygt AB, Solna, Sweden

Filed Mar. 24, 1970, Ser. No. 22,296
Claims priority, application Sweden, Apr. 1, 1969, 4655/69
Int. Cl. F04b 17/00, 35/00
U.S. Cl. 417—361 3 Claims



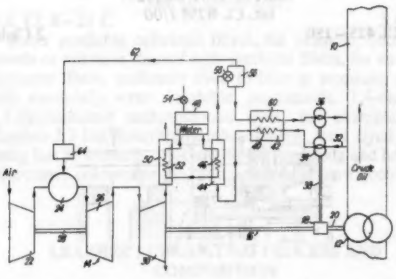
An immersible centrifugal pump unit which when lifted out of and lowered into a liquid is steered on a guide. The pump has a liquid outlet with a connecting flange parallel to the guide. The flange is sealed against a flange of an outlet pipe when the pump is submerged and brought into contact with the outlet pipe. A gripper on the pump engages the flange on the outlet pipe to hold the pump flange against the flange of the outlet pipe. The uppermost part of the opposing flange surfaces are at a level not higher than the lowermost point of engagement of the gripper and the flange of the outlet pipe.

3,656,872

PUMPING SYSTEMS

Albert Jubb, Kenilworth, England, assignor to Rolls Royce Limited, Derby, England

Filed Sept. 14, 1970, Ser. No. 71,755
Claims priority, application Great Britain, Sept. 18, 1969, 46,016/69
Int. Cl. F04b 17/00, 35/00
U.S. Cl. 417—364 5 Claims



A gas turbine engine is arranged to drive a pump which is positioned in a crude oil pipeline. An evaporator is adapted to receive some of the crude oil from which some of the lighter fractions of the oil are extracted by the evaporator which passes the lighter fractions to the engine as fuel.

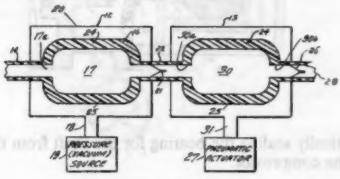
The evaporator has a heater which includes two heat exchangers, in one of which the crude oil is heated by the residue of crude oil from which the lighter fractions have been extracted and in the other one of which, the crude oil is heated by hot water which has been heated on a further heat exchanger by some of the exhaust gases from the gas turbine engine.

3,656,873

PULSATILE BY-PASS BLOOD PUMP

Peter Schiff, Box 117, Schwenksville, Pa.

Filed Nov. 6, 1970, Ser. No. 87,487
Int. Cl. F04b 43/06, 45/00; A61f 1/00; A61b 19/00
U.S. Cl. 417—395 18 Claims



A by-pass pump system especially adapted for use in assisting or temporarily replacing the circulatory function of the heart in which a pair of highly elastic collapsible containers are coupled to one another through a resilient flap valve. Each flexible chamber is positioned within an associated housing whose interior pressure is regulated to control the expansion and contraction of the flexible housings. Blood enters the first of said chambers causing the chamber to fill when the blood pressure is greater than the pressure of the surrounding housing. The one-way valve mechanism enables the blood filling the first flexible chamber to enter the second flexible chamber when the interior pressure of the second flexible chamber is lower than that of the first chamber. Conversely, if the pressure within the interior of the second resilient chamber is greater than that within the first flexible container, the one-way valve structure prevents reverse flow. Pneumatic means is coupled to the housing surrounding the second flexible container to cause the blood to be pumped through an outlet opening provided in the second flexible container in order to enter into the arterial system at a rate substantially equal to the normal pumping rate of the patient. A second one-way valve mechanism is provided in the aforesaid outlet opening to prevent reverse flow. The action of the flexible containers upon the blood is non-occlusive due to the pneumatic controls utilized, as well as the nature of the design of the chambers. The one-way valve mechanisms may alternatively be of a flap valve form or a form in which the closure portions of the valve are highly elastic to permit ready flow of the blood in a first direction while preventing flow in the reverse direction.

In one preferred design the one-way valve structures cooperate with their associated valve mounts to provide positive reliable operation and simple straightforward removal and insertion.

3,656,874

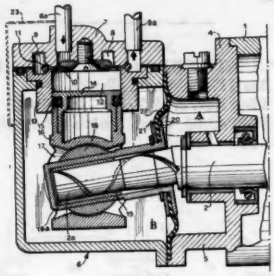
COMPRESSORS FOR REFRIGERATION SYSTEMS

Italo Pellizzetti, Corso Massimo D'Azeglio 10, Turin, Italy

Filed July 17, 1970, Ser. No. 55,805
Claims priority, application Italy, July 19, 1969, 52714 A/69; Jan. 14, 1970, 67091 A/70; Feb. 20, 1970, 67564 A/70
Int. Cl. F04b 17/00, 35/04; F16j 15/50
U.S. Cl. 417—415 7 Claims

A compressor for a sealed refrigeration system has a reciprocating piston operated by a drive shaft with an inclined end portion connected to the piston for example via a crank and slotted link. A non-rotatable coupling sleeve is

fitted on the inclined end of the drive shaft and sealingly connected to a deformable diaphragm surrounding the shaft and



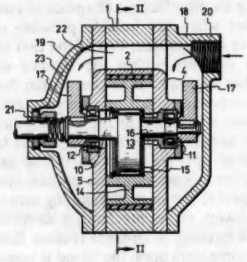
hermetically sealing the bearing for the shaft from the interior of the compressor.

3,656,875

ROTARY PISTON COMPRESSOR

Friedrich Luck, Berlin, Germany, assignor to Borsig GmbH, Berlin-Tegel and Wankel GmbH, Lindau, Germany

Filed Jan. 14, 1971, Ser. No. 106,335
Claims priority, application Germany, Jan. 19, 1970, P 20 02 075.1
Int. Cl. F01c *1/02, 21/04;* F04c *29/02*
U.S. Cl. 418—54 **3 Claims**



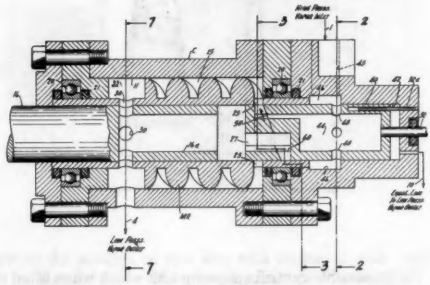
A circular piston compressor arranged as compressor in the closed circuit of a medium to which a limited quantity of lubricant is added and partially dissolved therein to lubricate the compressor. The compressor includes a stationary housing with trochoidal inner boundary, an eccentric shaft, and a rotary piston mounted on the eccentric of the eccentric shaft so that the axial centerline of the piston describes a circular path during rotation thereof. A cover is present on the drive side of the housing. A suction line of the compressor is arranged on the side of the housing opposed to the drive side so that at least a portion of the oil-mist permeated intake gas is directed substantially perpendicularly at the inside of the drive side housing cover. An end wall opposing the housing cover, and working chambers are present as an end intake port and a seal between the shaft and the housing cover. An annular chamber is arranged between the housing cover and the opposing end wall and bounding the working chambers so that the intake gas is deflected in the annular chamber at right angles in the direction of rotation of the piston toward the end intake port of the working chambers thus also traversing the region in which the shaft seal is installed.

3,656,876

ROTARY SCREW ENGINE HAVING ADJUSTABLE INTERNAL FEED AND ADJUSTABLE OUTLET CONTROL

Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.

Filed Sept. 9, 1970, Ser. No. 70,759
Int. Cl. F01c *1/16;* F03c *3/00;* F04b *49/00*
U.S. Cl. 418—185 **5 Claims**



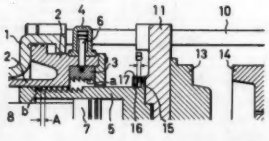
An expansion engine of the rotary screw type having cooperative male and female rotors in which high pressure vapor enters the engine at the inlet end of the rotors through internal and centrally located inlet ports. A central and adjustable control piston functions to admit high pressure vapor to the interior of the rotors which then enters the cavities between the rotors for ultimate expansion. The control piston has an equalizing port for controlling the fluid pressure in the expansion chamber so it will not be less than the pressure in the exhaust chamber of the engine, thereby contributing to the efficiency of the engine.

3,656,877

MOLD CLAMPING DEVICE FOR INJECTION MOLDING MACHINE

Katashi Aoki, 6037 Oaza Minamijo, Sakaki-machi, Japan

Filed Feb. 27, 1970, Ser. No. 14,993
Claims priority, application Japan, Feb. 28, 1969, 44/15174; Mar. 14, 1969, 44/19277
Int. Cl. B29f *1/00*
U.S. Cl. 425—150 **2 Claims**



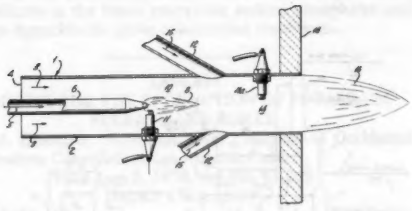
A mold clamping device for injection molding machines, in which a quick feed or closure ram is inserted in a mold clamping ram, and when a pair of molds is closed, said feed ram is pushed out from said clamping ram and said two rams are connected by means of a set of half nuts and a screw thread on the periphery of said feed ram engaging with each other, to attain a quick closure and tight clamping of the molds.

3,656,878

HIGH LUMINOSITY BURNER

Franklin J. Wright, Watchung, N.J., assignor to Esso Research and Engineering Company

Filed Mar. 26, 1970, Ser. No. 22,812
Int. Cl. F23m *3/04*
U.S. Cl. 431—10 5 Claims



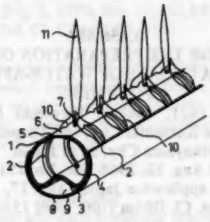
A method and apparatus for burning, at increased luminosity intensities. A fuel such as natural gas whose combustion is normally characterized by a low luminosity flame. A first hydrocarbon fuel which may include a fixed amount of a free radical promoter is burned in a diffusion flame. The products of this combustion, which include soot particles, are burned along with a second fuel such as natural gas. The flame produced in this secondary combustion has a luminosity greater than that produced by the combustion of said second fuel in a single-stage burner.

3,656,879

METHOD OF MANUFACTURING A BURNER AND A BURNER THUS MANUFACTURED

Hendrik De Vries, Jr., Nijmegen, Netherlands, assignor to N. L. Application S.A., Fribourg, Switzerland

Filed Apr. 29, 1970, Ser. No. 2,703
Claims priority, application Netherlands, July 14, 1969, 6,910,775; Jan. 14, 1969, 6,900,555
Int. Cl. F23d *13/36*
U.S. Cl. 431—349 26 Claims



A gas burner comprising a tube having a gas supply connection, there being a sleeve partly engaging the outside of the tube and partly spaced therefrom whereby to define a space between the sleeve and the tube presenting a gas expansion chamber, outlet ports in the tube and means placing the chamber in communication with the ports. The burner is manufactured by forming an outlet port in a tube, forming a longitudinal groove in the tube and placing a sleeve having grooves therein over the tube whereby to create the gas expansion chamber and placing the same in communication with the outlets.

CHEMICAL

3,656,880

UNIFORMLY DYED BLUE OR TURQUOISE WATER SWELLABLE CELLULOSIC FIBERS

John Blackwell, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1969, Ser. No. 879,901
Int. Cl. D06p *3/82*
U.S. Cl. 8—21 C 3 Claims

Water swellable cellulosic fibers, for example, cotton, or blends or mixtures thereof with synthetic fibers, for example, polyester fibers, uniformly dyed to blue or turquoise shades with essentially water insoluble, nonvattable, 1,4-diamino-2,3-disubstituted anthraquinone dyes, for example, 1,4-diamino-2,3-bis(phenylthio)anthraquinone, said dyed fibers being fast to washing, dry-cleaning and crocking and having a reflectance color value (S') after scour of at least about 2.

3,656,881

LEATHER LUBRICATING PROCESS AND COMPOSITION

Robert W. Hemwall, Chatham, N.J., assignor to Shell Oil Company, New York, N.Y.

Filed June 2, 1969, Ser. No. 829,729
Int. Cl. C14c *5/00, 11/00*
U.S. Cl. 8—94.23 5 Claims

Low-oil-content, fully lubricated leather is produced by (1) treatment of leather with water emulsions of mixtures of alkanolamine soaps, oils, surfactants having HLB values between 2 and 6, and coupling solvents; and (2) acidification of the leather.

3,656,882

ACRYLIC FIBER STABILIZATION CATALYZED BY CO(II) AND CE(III) CATIONS

John Perry Riggs, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,965
Int. Cl. C01b *31/07*
U.S. Cl. 8—115.5 16 Claims

A process is provided wherein the thermal stabilization of an acrylic fibrous material is accelerated by heating in an oxygen-containing atmosphere in the presence of a catalytic quantity of Co(II) and Ce(III) metallic cations which have been found capable of promoting the oxidative cross-linking of adjoining polymer molecules. The resulting stabilized fibrous materials are non-burning when subjected to an ordinary match flame, and may be utilized as fire resistant textile fibers, or optionally converted to a carbonized fibrous material by heating in an inert atmosphere at a more highly elevated temperature.

3,656,883

PROCESS FOR THE STABILIZATION OF ACRYLIC FIBERS

John Perry Riggs, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Mar. 9, 1970, Ser. No. 17,968
Int. Cl. D06m *9/00*
U.S. Cl. 8—115.5 20 Claims

A process is provided wherein the thermal stabilization of an acrylic fibrous material is accelerated by heating in an ox-

ygen-containing atmosphere following treatment while in contact with an aqueous solution wherein a substantial quantity of molecular oxygen is generated in intimate association with the fibrous material through the catalyzed decomposition of hydrogen peroxide. The resulting stabilized fibrous materials are non-burning when subjected to an ordinary match flame, and may be utilized as fire resistant textile fibers, or optionally converted to a carbonized fibrous material by heating in an inert atmosphere at a more highly elevated temperature.

3,656,884

PROCESS FOR THE PREPARATION OF GRAFTED SOLID MATERIALS OF WATER-AFFINITIVE POLYMERS

Takuji Okaya, 1621, Sakaza; Hirotoshi Miyazaki, 1652, Sakaza, both of Kurashiki City, and Tamotsu Eguchi, 19-19 Ekimoto-cho, Okayama City, all of Japan

Filed Aug. 12, 1968, Ser. No. 751,720
Claims priority, application Japan, Aug. 17, 1967, 42/53140
Int. Cl. D06m *1/00*; C08f *15/00*
U.S. Cl. 8—116 11 Claims

Process for the preparation of grafted solid materials of water-affinitive polymers such as polyvinyl alcohol, acetalized polyvinyl alcohol, polyamide, polyacrylonitrile and cellulose, which comprises immersing said solid material in an aqueous solution or suspension of an ester of acrylic acid or metacrylic acid at a temperature of 40° – 120° C., in the presence of 20 – 1,000 ppb of molecular oxygen, as a reaction initiating component, in the aqueous solution or suspension. In this way, the graft polymerization reaction is initiated smoothly and high reaction rate of the graft polymerization is obtained without the substantial formation of homopolymer of the ester in the liquid phase.

3,656,885

HIGH STRENGTH WRINKLE RESISTANT COTTON FABRICS PRODUCED BY A PROCESS INVOLVING BOTH MONOSUBSTITUTION AND CROSSLINKING OF THE COTTON

Domenick Donald Gagliardi, East Greenwich, R.I., assignor to Cotton, Incorporated, Memphis, Tenn.

Filed Nov. 15, 1967, Ser. No. 683,135
Int. Cl. D06m *13/54*, *13/40*, *13/10*
U.S. Cl. 8—116.3 10 Claims

Improvement in the wear resistance of cotton fabrics in so-called wash-wear or durable press garments is attained using a concept of treatment referred to as SSX involving swelling conducted to increase sites for chemical reactions, substitution to introduce bulky, plasticizing side groups and crosslinking the distended polymer network in cotton fibers to achieve more uniformly placed crosslinks than in prior known wrinkle resistance treatments.

3,656,886

CORROSION INHIBITORS

George C. Blytas, Kensington, Calif., assignor to Shell Oil Company, New York, N.Y.

Filed Jan. 12, 1970, Ser. No. 2,439
Int. Cl. C23f *11/10*
U.S. Cl. 21—2.5 4 Claims

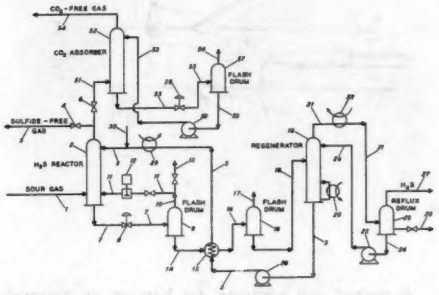
Corrosivity of non-aqueous solutions of copper ions useful in olefin separation processes is greatly reduced by addition of from about 0.5 to about 15 percent by weight of a metal salt of an ortho-hydroxy aromatic carboxylic acid to such solutions.

3,656,887

METHOD OF REMOVING HYDROGEN SULFIDE FROM GASEOUS MIXTURES

Shigeto Suzuki, San Francisco; Giok H. Tjoa, Placentia, and Karl H. Kilgren, La Habra, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 21, 1969, Ser. No. 851,871
Int. Cl. B01d *53/16*, *53/34*
U.S. Cl. 23—2 R 8 Claims



The process for selectively removing H_2S and like sulfides from fluids containing them by contact with a cyanopyridine (e.g., a mixture of ortho and meta cyanopyridines) and an alkali hydrosulfide, preferably in a substantially hydroxyl-free solvent such as N-methyl pyrrolidone. Preferably, in the process an admixture of H_2S and CO_2 in natural gas is contacted with the cyanopyridine containing contacting solution to react the H_2S with said cyanopyridine, the CO_2 and/or like hydrocarbons are rejected from the contacting solution by mild heating and/or pressure reduction and thereafter H_2S is regenerated by heating the remaining solution.

3,656,888

LIQUID PHASE OXIDATION PROCESS

Henry F. Barry; Calvin J. Hallada, both of Ann Arbor, and Robert W. McConnell, South Lyon, all of Mich., assignors to American Metal Climax, Inc.

Filed Oct. 2, 1969, Ser. No. 863,197
Int. Cl. C22b *59/00*
U.S. Cl. 23—15 W 7 Claims

A process for effecting an aqueous liquid phase oxidation of molybdenum disulfide to molybdenum oxide by agitating, at elevated temperature, a slurry of molybdenum disulfide particles in water, under pressure, in the presence of oxygen for a period of time sufficient to effect the conversion of at least a portion of the molybdenum disulfide to molybdenum oxide, and thereafter extracting the molybdenum oxide product from the reaction medium.

3,656,889

STABLE AQUEOUS SODIUM ALUMINATE SOLUTIONS

Edward W. Olewinski, Cicero, Ill., assignor to Nalco Chemical Company, Chicago, Ill.

Filed Oct. 12, 1970, Ser. No. 80,119
Int. Cl. C01f *7/02*
U.S. Cl. 23—52 4 Claims

The use of a synergistic blend of tartaric and gluconic acids or their salts has been found to effectively stabilize aqueous sodium aluminate solutions.

3,656,890

CHLORINATED TRISODIUM PHOSPHATES

Arthur D. F. Toy, Stamford, Conn., and Russell N. Bell, Ardsley, N.Y., assignors to Stouffer Chemical Company, New York, N.Y.

Filed Sept. 5, 1969, Ser. No. 855,757
Int. Cl. C01b *11/00*; A01b *1/00*; C01b *25/16*
U.S. Cl. 23—50 R 6 Claims

Chlorinated trisodium phosphates of high available chlorine contents are produced by including small percentages, e.g. 0.5 percent of alkali metal silicate, e.g., sodium metasilicate in the batch containing sodium phosphates and sodium hypochlorite under chlorination conditions.

3,656,891

PROCESS FOR THE PRODUCTION OF POTASSIUM SULFATE AND BORAX

Elie M. Chemtob, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed Aug. 5, 1970, Ser. No. 61,218
Int. Cl. C01b *25/00*
U.S. Cl. 23—59 9 Claims

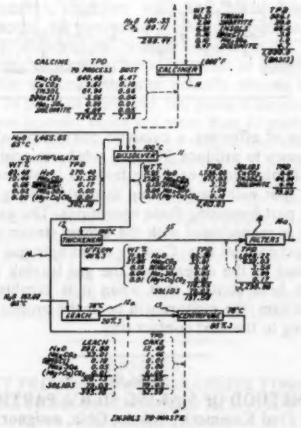
Glaserite and sylvite are digested in the presence of borax in a metathesis reactor at a temperature above the crystallization temperature of borax to form a borax free potassium sulfate precipitate and a metathesis liquor containing borax Residual potassium values in the metathesis end liquor are converted to glaserite by sulfate ion addition for recycle to the metathesis reactor. Cooling the resultant solution then precipitates borax.

3,656,892

METHOD OF PRODUCING SODA ASH

Douglas J. Bourne, and Frank E. Lamb, both of Tucson, Ariz., assignors to Duval Corporation, Houston, Tex.

Continuation of application Ser. No. 590,308, Oct. 28, 1966, now abandoned. This application Sept. 19, 1969, Ser. No. 863,673
Int. Cl. C01d *7/12*
U.S. Cl. 23—63 6 Claims



This patent discloses a system for obtaining anhydrous sodium carbonate from crude sodium sesquicarbonate. The sesquicarbonate is calcined and impurities removed. The intermediate product, a solution of sodium carbonate, is evaporated under temperature conditions which result in growth of anhydrous sodium carbonate crystals. In the last stage of evaporation a co-solute of sodium hydroxide or sodium chloride is added to shift the phase boundary of sodium carbonate sufficiently to permit the last stage of crystallization to be carried out at atmospheric pressure while still growing crystals of anhydrous sodium carbonate. The preferred co-solute is sodium hydroxide and a system is shown for treating a bleed of the sodium hydroxide liquor from the last stage of evaporation to remove therefrom undesirable contaminants.

3,656,893

ION EXCHANGE REMOVAL OF CYANIDE VALUES

Walter John Sloan, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 2, 1970, Ser. No. 52,141
Int. Cl. C01c *3/08*, *3/00*
U.S. Cl. 23—77 6 Claims

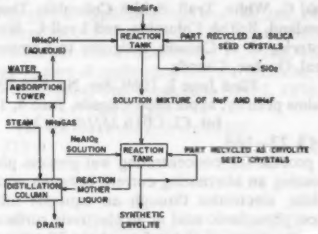
A method of removing cyanide values from aqueous solutions containing sodium or potassium cyanide, or the sodium or potassium salts of the complex cyanides of the metals copper, nickel, zinc, silver, gold and cadmium, utilizing a mixed bed of ion exchange resins.

3,656,894

PROCESS FOR THE PRODUCTION OF HIGH QUALITY SYNTHETIC CRYOLITE

Makoto Kadotani, Ube, and Seishiro Isobe, Yamaguchi, both of Japan, assignors to Central Glass Co., Ltd., Ube-shi, Yamaguchi-ken, Japan

Filed May 8, 1970, Ser. No. 35,719
Int. Cl. C01f *7/54*, *7/50*; C01d *3/02*
U.S. Cl. 23—88 6 Claims



Process for producing high quality synthetic cryolite which comprises mixing a fluoride mixed solution obtained by the ammoniation of sodium silico-fluoride and being free from a filtrable silica with a solution of sodium aluminate of an Na_2O/AL_2O_3 molar ratio above 1.0, the 6F/A1 ratio in the mixed solution being maintained within the range between 1.0 and 1.2 thereby to adjust the pH of the mixed solution within the range of 8 to 12 without any neutralization procedure, and reacting the mixture at a temperature from 60° C. to the boiling point of the reaction solution in the presence of seeds of cryolite. The synthetic cryolite so obtained contains no chiolite and suffers from very little ignition loss.

3,656,895

RECOVERY OF CALCIUM FLUORIDE FROM FLUORSPAR ORE

Venacio V. Mercade, Metuchen, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Township of Woodbridge, N.J.

Filed May 1, 1970, Ser. No. 33,868
Int. Cl. C01f *11/22*
U.S. Cl. 23—88 5 Claims

Calcium fluoride is recovered from a finely mineralized fluorspar ore containing inclusions of barite within microsize particles of fluorite. The ore is pugged and a fine-size fraction is recovered and roasted with a chloride salt,

preferably calcium chloride, and carbon. The roasted product is lixiviated with water to remove the barium chloride reaction product and treated with hydrochloric acid to extract residual impurities. Alternatively, the roasted product is extracted directly with the acid. The acid-extracted product may be further purified by extraction with a hydrosulfurous compound.

3,656,896

PROCESS FOR THE MANUFACTURE OF FINE PARTICULATE MADDRELL'S SALT

Winfried Kern, Hurth near Cologne; Oskar Gehrig, Mannheim, and Heinz Harnisch, Lovenich near Cologne, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Koln and Benckiser-Knapsack GmbH, Ludwigshafen am Rhine, Germany

Filed Nov. 4, 1970, Ser. No. 86,969

Claims priority, application Germany, Nov. 13, 1969, P 19 57 063.9

Int. Cl. C01b *25/30*

U.S. Cl. 23—106 **4 Claims**

Production of fine particulate Maddrell's salt by subjecting coarsely granular Maddrell's salt to grinding. The ground Maddrell's salt is annealed for a period of between 0.5 and 4 hours at a temperature of between 360° and 420° C., and a product with a low fraction of water-soluble matter therein is obtained.

3,656,897

CONCENTRATION OF PHOSPHORIC ACID

Arnold G. White, Trail, British Columbia; Thomas E. Smith, Rossland, British Columbia, and Lyall C. Work, Dunnville, Ontario, all of Canada, assignors to Cominco Ltd., Montreal, Quebec, Canada

Filed June 2, 1969, Ser. No. 829,732

Claims priority, application Canada, June 4, 1968, 21,706

Int. Cl. C01b *25/18, 25/24*

U.S. Cl. 23—165 **1 Claim**

A process for concentrating wet-process phosphoric acid by passing an alternating current between non-reactive, e.g. graphite, electrodes through an aqueous solution of wet-process phosphoric acid at an electrode surface current density in the range of about 5 to about 20 amperes per square inch, preferably about 7 to 15 amperes per square inch.

3,656,898

TRANSFORMATION OF PHOSPHORUS COMPOUNDS OBTAINED AS BY-PRODUCTS

Heinz Harnisch, Lovenich near Cologne; Ursus Thummler, Hurth near Cologne; Karl Traulsen, Knapsack near Cologne, and Gerhard Hartlapp, Hermulheim near Cologne, all of Germany, assignors to Knapsack Aktiengesellschaft, Knapsack near Cologne, Germany

Continuation of application Ser. No. 519,946, Jan. 11, 1966, now abandoned. This application May 14, 1969, Ser. No. 853,994

Claims priority, application Germany, Feb. 17, 1965, K 55 302

Int. Cl. C01b *25/12*

U.S. Cl. 23—165 **8 Claims**

A process whereby substantially low-valent phosphorus-containing compounds in waste by-products obtained in the manufacture of mineral and organic phosphorus compounds are converted into useful phosphoric acid, polyphosphoric acid, or corresponding alkali metal salts thereof despite the presence of partially non-combustible material, organic pentavalent compounds, and non-phosphorus-containing compounds within said material; by introducing the by-products into an elemental phosphorus-oxygen flame having excess oxygen, the by-products being introduced in an amount so as not to exceed 50 percent by weight of the elemental phosphorus being burned in said flame.

3,656,899

PROCESS FOR THE MANUFACTURE OF NITROUS OXIDE

Hans Tuisko Baechle, Glashutten, Taunus, and Rudolf Kohlhaas, Frankfurt/Main, both of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Mar. 27, 1970, Ser. No. 23,305

Claims priority, application Germany, Apr. 25, 1969, P 19 21 181.5

Int. Cl. C01b *21/22*

U.S. Cl. 23—158 **6 Claims**

To produce N_2O, ammonium nitrate is decomposed in an aqueous, chloride-containing solution in nitric acid while an ammonia atmosphere is maintained above the reaction mixture. The preferred temperature range of the solution is 110°—125° c. The atmosphere of ammonia is maintained by introducing at least part of the required ammonia into the gas volume of the reaction vessel. The decomposition of the ammonium nitrate and the formation of N_2O is enhanced by the presence of catalytically active ions of manganese, copper, cerium, lead, bismuth, cobalt and nickel; manganese, especially in its bivalent form, being preferred.

3,656,900

PROCESS FOR THE CATALYTIC CONVERSION OF SULFUR DIOXIDE TO SULFUR TRIOXIDE WITH PRODUCTION OF SULFURIC ACID

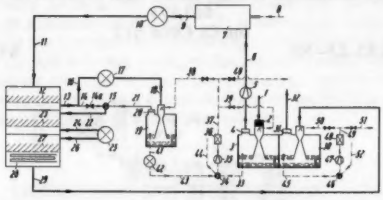
Herbert Drechsel; Gustav Rowedder; Karl-Heinz Dorr, and Hugo Grimm, all of Frankfurt/Main, Germany, assignors to Metallgesellschaft AG, Frankfurt (Main), Germany

Continuation of application Ser. No. 686,249, Nov. 28, 1967, now abandoned. This application June 24, 1970, Ser. No. 56,052

Claims priority, application Germany, Dec. 3, 1966, M 71879

Int. Cl. C01b *17/76*

U.S. Cl. 23—168 **10 Claims**



Process of effecting a catalytic conversion of SO_2 - containing gases to produce SO_3 and sulphuric acid wherein the SO_3 containing gases evolving from at least one conversion tray are split with part passing through cooling and absorption and part bypassing these operations. The gas leaving the absorber is recombined with the bypass stream and then fed to the next contact tray. Cooling of the split gas stream is accomplished to the extent that the gas leaving the absorber has such heat content that when it is combined with the bypass stream, the mixture will be at the proper temperature for feeding to the next contact tray.

3,656,901

METHOD OF MAKING SILICA PARTICLES

Herman Fred Kummerle, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Aug. 30, 1967, Ser. No. 664,246

Int. Cl. C01b *33/16*; B01j *11/44*

U.S. Cl. 23—182 **16 Claims**

Silica particles, e.g., in bead form, are prepared from an alkali-metal (preferably sodium) silicate in an aqueous-organic reaction medium at ambient (preferably) or higher temperature and at a pH within the range of from 4.5 to 10. The organic (preferably recoverable organic) medium is critical and

has a specifically defined bead-making capability. It provides a dispersed phase in which a silica "hydrosol" derived from an alkali-metal silicate is soluble and wherein it can polymerize to yield gelled particles of silica.

Examples of operative organic media are n-hexylamine, 2-ethylhexylamine, 2-methyl-5-ethylpyridine, n-hexyl Carbitol and n-hexyl Cellosolve. Organic media found to be inoperative are 2-methyl-1-pentanol, 1-hexanol, 5-ethylbutanol and n-butanol.

Descriptions are given of the two different types of silica products that are obtained; also, details of operating conditions and factors that influence the type of silica particles that result.

The silica products are useful as, for example, catalysts and catalyst supports, and in other applications wherein silica in particulate form is employed.

3,656,902

METHOD FOR TREATING A BROKEN-AWAY REFRACTORY LINING OF A METALLURGICAL FURNACE, CONSISTING OF DOLOMITE BRICKS

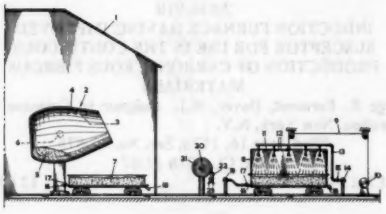
Adam Steen, 52, Spoellaan, Heemskerk, Netherlands

Filed Nov. 22, 1968, Ser. No. 778,171

Claims priority, application Germany, Nov. 25, 1967, P 15 83 267.4

Int. Cl. C01f *5/16, 11/02;* **C22b** *1/16*

U.S. Cl. 23—188 **10 Claims**



The broken-away worn out dolomite brick lining of metallurgical furnaces, together with the metal and clinker residues therein, are processed to recover useful substances therefrom by treating the broken lining in a hot condition with a quantity of water as liquid or steam or both, sufficient to enable the broken linings to actually absorb by weight from 10 to 20 parts of water per 100 parts of dolomite brick, said sufficient quantity being not more than 45 parts of water per 100 parts of dolomite brick, by weight, and the reaction being carried out at elevated temperature. This processing causes the brick to fall apart in a short time into a dry powder mass with the coarser steel and clinker residue parts present therein. After an hour's wait, the powder is separated by suction from the metal and clinker residues which remain behind, air preferably being injected into the mass to fluidize the powder during this operation. The recovered dolomite powder may be supplied to a sintering plant for fine ore. Apparatus for facilitating the process is also disclosed.

3,656,903

DIRECT PRODUCTION OF GRAPHITE FIBROUS MATERIALS FROM PREOXIDIZED ACRYLIC FIBROUS MATERIALS

Dagobert E. Stuetz, Westfield, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Apr. 10, 1969, Ser. No. 815,200

Int. Cl. C01b *31/07*

U.S. Cl. 23—209.1 **24 Claims**

A rapid process is provided for the direct conversion of a preoxidized acrylic fibrous material containing at least about 7 percent bound oxygen by weight to a fibrous material of predominantly graphitic carbon. The preoxidized acrylic fibrous material is initially impregnated with an organic protective agent and subsequently is passed through a reducing flame which imparts a minimum fiber temperature of at least 1,900°C. while the fibrous material is under tension at least sufficient to prevent visible sagging. In a preferred embodiment of the invention, the reducing flame is generated by a fuel-oxidant mixture, e.g., an acetylene and oxygen mixture.

3,656,904

GRAPHITIZATION PROCESS

Michael J. Ram, West Orange, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed June 10, 1970, Ser. No. 45,160

Int. Cl. C01b *31/07, 31/04*

U.S. Cl. 23—209.1 **31 Claims**

An improved process is provided for the production of a continuous length of a graphitic fibrous material through the catalysis of the graphitization reaction. While a continuous length of fibrous material capable of undergoing graphitization is continuously passed through a heating zone provided with an inert gaseous atmosphere having a maximum temperature of at least 2,000° C., at least one gaseous stream containing a catalytic quantity of a volatile alkyl borate in vapor form which is capable of catalyzing the graphitization reaction is introduced into the heating zone.

3,656,905

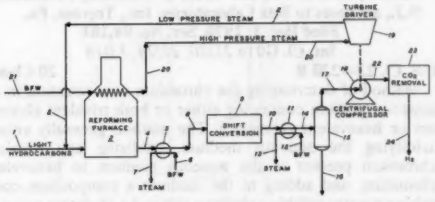
HYDROGEN MANUFACTURE

Calvin S. Smith, and William J. McLeod, both of El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of application Ser. No. 788,262, Dec. 31, 1968, now Patent No. 3,532,467, which is a continuation-in-part of application Ser. No. 736,520, May 17, 1968, which is a continuation-in-part of application Ser. No. 665,106, Sept. 1, 1967, now abandoned. This application Nov. 2, 1970, Ser. No. 86,162

Int. Cl. C01b *1/02, 1/16, 21/00*

U.S. Cl. 23—212 R **6 Claims**



A process for producing high pressure hydrogen which comprises: (a) reforming hydrocarbons with low pressure steam to produce a gas stream comprising hydrogen and CO_2; (b) centrifugally compressing at least a portion of the gas stream comprising hydrogen and CO_2 to obtain a stream comprising compressed hydrogen and CO_2; (c) removing CO_2 from the compressed gas stream comprising hydrogen and CO_2 by absorbing CO_2 in a physical absorbent; (d) using high pressure steam to drive a turbine which turbine in turn drives the centrifugal compressor used to compress the hydrogen and CO_2; and (e) using low pressure exhaust steam from the turbine as said low pressure steam for reforming hydrocarbons in step (a). Preferably the low pressure steam is at a pressure between 50 and 500 psig, the high pressure steam is at a pressure between 200 and 2000 psig, and there is at least a 150 psi differential in pressure between the low and high pressure steam. According to a preferred embodiment, CO_2 is removed using a mixed absorbent comprising a chemical absorbent and a physical absorbent.

3,656,906
METHOD FOR DETECTING AND QUANTITATING THE PRESENCE OF CANNABINOIDS AND ANALOGS THEREOF IN BIOLOGICAL MATERIALS AND RESULTING PRODUCTS

Francis J. Bullock, Acton, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Apr. 13, 1970, Ser. No. 28,015
Int. Cl. G01n *31/22*
U.S. Cl. 23—230 B **3 Claims**

A method for detecting and quantitating submicrogram quantities of cannabinoids and their analogs in biological materials including blood plasma and urine. Detection system is based on the condensation of the cannabinoids with a polycarboxylic acid to give a highly fluorescent derivative, the intensity of the fluorescence being maximized in the pH range of 9–11.

3,656,907
MODIFIED KARL FISCHER REAGENT

Clive Stephen Delmonte, 12 High Road, Buckhurst Hill, England

Filed July 2, 1970, Ser. No. 52,009
Claims priority, application Great Britain, July 14, 1969, 35,246/69; Dec. 6, 1969, 59,701/69; Feb. 20, 1970, 8,347/70; Mar. 18, 1970, 13,126/70
Int. Cl. C09k *3/00*; **G01n** *33/18*
U.S. Cl. 23—230 R **12 Claims**

A modified Karl Fischer reagent containing, as the reducing agent, a sulphoxide or an organic nitrite of relatively low vapor pressure, and a base which is not pyridine but is a substantially odorless base containing the pyridine skeleton.

3,656,908
METHOD OF DETERMINING THE CHROMIUM CONTENT OF AQUEOUS MEDIUMS

Charles A. Noll, Philadelphia; Edward C. Feddern, West Chester, both of Pa., and Louis J. Stefanelli, Pennsauken, N.J., assignors to Betz Laboratories, Inc., Trevose, Pa.

Filed Dec. 1, 1970, Ser. No. 94,181
Int. Cl. G01n *21/20, 21/24, 33/18*
U.S. Cl. 23—230 R **20 Claims**

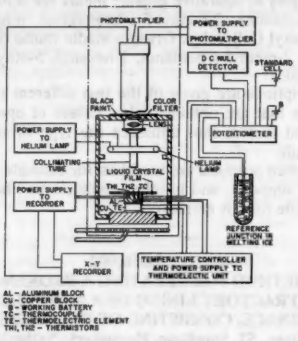
Method of determining the chromium concentration in an aqueous medium containing either or both trivalent chromium or hexavalent chromium. The method generally entails acidifying the aqueous medium, oxidizing any trivalent chromium present in the aqueous medium to hexavalent chromium, and adding to the medium a composition comprising a water-soluble cobaltous salt and a chelating agent of the acetic acid derivative type. The color intensity of the resulting medium is then measured and compared to the intensity of samples of aqueous medium containing known quantities of chromate in its hexavalent state which have been treated in the same manner. One of the other features of the invention is the composition used in the method.

3,656,909
CHOLESTERIC LIQUID CRYSTAL STABILIZERS FOR DETECTOR ELEMENTS

George D. Dixon, Monroeville, and Luciano C. Scala, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 16, 1970, Ser. No. 11,449
Int. Cl. C09k *1/00*; **G01n** *31/22*; **G02f** *1/00*
U.S. Cl. 23—253 TP **12 Claims**

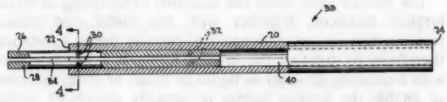
A sensing device is made by protectively packaging a cholesteric liquid crystalline material containing from about 0.3 to 7 weight percent of an ultraviolet radiation stabilizer consisting of either aromatic azo or aromatic azoxy compounds, in a clear compatible protective polymeric material.



3,656,910
INDUCTION FURNACE HAVING IMPROVED SUSCEPTOR FOR USE IN THE CONTINUOUS PRODUCTION OF CARBONACEOUS FIBROUS MATERIALS

George R. Ferment, Dover, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed June 16, 1970, Ser. No. 46,675
Int. Cl. C01b *31/07*
U.S. Cl. 23—259.5 **12 Claims**



A graphite susceptor for use in a tube furnace during the production of a continuous length of a carbonaceous fibrous material. The graphite susceptor has a passageway extending therethrough which includes an entrance portion and an exit portion with the cross-sectional area of the entrance portion being of a smaller cross-sectional area than that of the exit portion. In a preferred embodiment of the invention the cross-sectional area of the entrance portion has a rectangular configuration, and is adapted for use in the production of graphitic tapes consisting of a plurality of continuous graphite filaments.

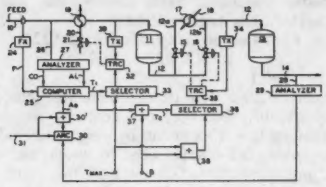
3,656,911
CONTROL SYSTEM FOR HYDROGENATION REACTIONS

James W. Hobbs, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed June 8, 1970, Ser. No. 44,037
Int. Cl. C07b *1/00*
U.S. Cl. 23—253 A **6 Claims**

A control system for a selective hydrogenation reaction computes the desired feed input temperature to the reactor in response to measurements of flow rate and analyses of the

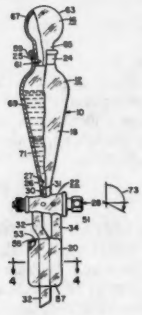
inlet and effluent streams. The temperature of the feed stream is regulated in response to a comparison of the computed temperature with a measured temperature of the feed stream.



3,656,912
LIQUID SEPARATORY APPARATUS

Ken F. Sugawara, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 14, 1970, Ser. No. 37,149
Int. Cl. G01f *11/00*; G01l *3/00, 3/02*
U.S. Cl. 23—259 **13 Claims**



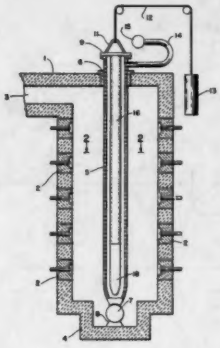
A liquid separatory apparatus for analytical purposes including a first compartment, at least one second compartment, valve means interposed therebetween, and a closure means. The first compartment includes an inlet portion on one end, an outlet portion on the other end and serves to initially contain the liquid during its separation into at least two phases of differing density. Each second compartment has an inlet portion and an opening to atmosphere, with each inlet portion being operatively and separately connected by the valve means to the first compartment outlet portion; said valve means including a drain portion open to atmosphere. The closure means serves for closing the first compartment inlet portion and includes an opening to atmosphere while the second compartments serve as separate storage reservoirs for the desired phases of differing density while the undesired phases are drained from the apparatus. Each of the stored phases may then be separately transferred back to the first compartment upon partial inversion of the apparatus.

3,656,913
CATALYTIC REACTOR

Emil Blaha, Cheltenham, and Maurice R. Kitzen, Elkins Park, both of Pa., assignors to Selas Corporation, Dresher, Pa.

Filed Jan. 27, 1970, Ser. No. 6,254
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 M **5 Claims**

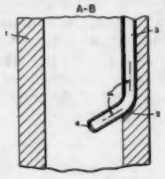
A catalytic reactor in which the catalyst is on the surface of a core that extends axially through the reactor tube to form an annular space through which the reactants flow.



3,656,914
FILLED REACTION TUBE PROVIDED WITH TEMPERATURE SENSORS

Wilhelm Friedrichsen; Guenter Poehler; Gert Goeschel, all of Ludwigshafen, and Gerhard Schaefer, Limburgerhof, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Mar. 13, 1970, Ser. No. 19,420
Claims priority, application Germany, Mar. 15, 1969, P 19 13 267.3
Int. Cl. B01j *9/04*; G01k *1/08, 1/14*
U.S. Cl. 23—288 M **5 Claims**



A catalyst-filled reaction tube provided inside with several temperature sensors, and the insertion of electric leads and their protecting tubes in axial recesses in the tube wall (which may be homogeneous or consist of several layers) without making holes in the tube wall.

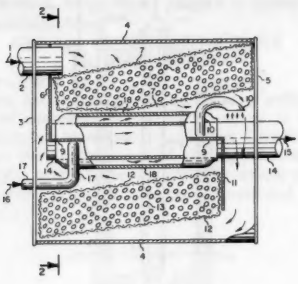
3,656,915
CATALYTIC EXHAUST GAS TREATMENT APPARATUS

John F. Tourtellotte, Westfield, N.J., assignor to Chemical Construction Corporation, New York, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,359
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 F **12 Claims**

An apparatus for catalytically treating the exhaust gas from internal combustion engines in two stages, with the first catalyst stage reducing nitrogen oxides, and the second stage oxidizing hydrocarbons and carbon monoxide. Preheated air is injected into the exhaust gas stream between the stages,

and the final hot fully reacted exhaust gas serves to preheat the air. The entire apparatus is disposed in a single container



having flat inclined catalyst beds and a central co-axial heat exchange section.

3,656,916

PRODUCTION OF PHOSPHONITRILIC CHLORIDES

Richard Schiedermaier; Karl Wintersberger, both of Ludwigshafen, and Gerd Wunsch, Speyer, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Apr. 8, 1970, Ser. No. 26,749

Claims priority, application Germany, Apr. 12, 1969, P 19 18 697.1

Int. Cl. C01b *21/52, 25/00*

U.S. Cl. 23—357 **4 Claims**

Phosphonitrilic chlorides having the general formula: $PNCl_2)_n$ where n denotes an integer of at least 3 and which contain a high proportion of trimeric and tetrameric cyclic phosphonitrilic chlorides are prepared by reaction of phosphorus pentachloride with ammonia in an inert solvent. The solution should contain not more than 5 moles of phosphorus pentachloride per liter. Ammonia is introduced at a rate not exceeding 0.12 liter per minute per mole of the phosphorus pentachloride contained in the whole solution until one tenth to one third of the total amount of ammonia required has been introduced.

3,656,917

STEEL ALLOY TUBES

Osamu Kikkawa, and Akira Kambayashi, both of Yokohamashi, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Original application May 16, 1967, Ser. No. 683,720, now Patent No. 3,554,734. Divided and this application Apr. 10, 1969, Ser. No. 815,215

Claims priority, application Japan, Sept. 10, 1966, 41/59491

Int. Cl. B21c *37/00*

U.S. Cl. 29—193 **6 Claims**

Low carbon steel alloy tubes of high tensile strength. The steel alloy contains less than 0.23% carbon, less than 0.5% silicon, from 1.00 to 1.50% manganese, less than 0.040% phosphorus, less than 0.040% sulfur, less than 0.30% copper, less than 0.50% chromium, from 0.010 to 0.080% aluminum, and the remainder of iron and impurities in an amount and variety which do not impair the desired characteristics of the alloy. There is preferably not less than 0.20% silicon and from 1.00 to 1.35% manganese. This steel after being rolled into a steel plate is welded into a steel tube of high tensile strength. Also, the steel alloy is a killed steel and in particular an aluminum killed steel.

3,656,918

A COMPOSITE WELDED FERROUS ARTICLE

William T. De Long, and Paul T. Corcoran, both of West Manchester Township, York County, Pa., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Dec. 30, 1969, Ser. No. 889,321

Int. Cl. B32b *15/00*

U.S. Cl. 29—196.1 **1 Claim**

A low carbon steel weld deposit containing chromium up to 1.0, preferably 0.05–0.6, per cent. by weight, nickel 6.5–11, preferably 7–9, per cent. by weight, molybdenum up to 1.0, preferably 0.2–0.8, per cent. by weight and vanadium up to .12, preferably 0.04–0.09, per cent. by weight.

Also a low carbon steel weld deposit consisting essentially of

Element	Percent by Weight	
	Broad	Preferred
Carbon	.03 – .12	.06 – .10
Manganese	.05 – 1.0	.1 – .8
Silicon	.20 – .70	.25 – .55
Chromium	up to 1.10	.05 – .6
Nickel	6.5 – 11.	7 – 9
Molybdenum	up to 1.0	.2 – .8
Vanadium	up to .12	.04 – .09
Phosphorus	.020 max.	.012 max.
Sulfur	.020 max.	.012 max.
Iron	Balance	Balance

which exhibits a yield strength of at least 130 ksi and Charpy V-notch energy absorption at −60° F. of at least 20 ft.-lbs. after heat treatment consisting of austenitizing at 1,500° F. for 1 hour, water quenching, tempering at 1,100° F. for 1 hour and water quenching.

3,656,919

COMPOSITE METAL HAVING A NICKEL ALLOY BASE WITH A DIFFUSED COATING

Joseph G. Lucas, Trumbull; William R. Freeman, Jr., Easton, and Warren A. Rentz, Trumbull, all of Conn., assignors to Avco Corporation, Stratford, Conn.

Original application Nov. 1, 1965, Ser. No. 506,292, now Patent No. 3,493,476. Divided and this application June 19, 1969, Ser. No. 834,789

Int. Cl. B32b *15/00*

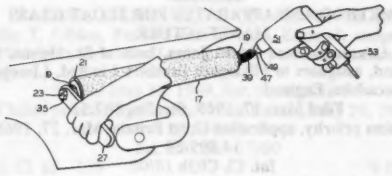
U.S. Cl. 29—197 **6 Claims**

A method of producing a sulfidation and oxidation resistant coating upon nickel base alloys, and article produced thereby wherein chromium and aluminum-silicon layers are imposed upon the base and then subject to such temperatures as will cause diffusion of these layers, resulting in a product wherein the base material is provided with a chromium rich intermediate layer and an aluminum rich exterior layer.

3,656,920
POWER SANDING DEVICE

Hosea W. Helms, 7336 Lohmeyer Avenue, Maplewood, Mo.

Filed Aug. 15, 1969, Ser. No. 850,424
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 PT 13 Claims



A power sanding device for sanding irregular surfaces such as those of automobile bodies, comprising a rigid shaft rotatably journaled at one end in a radial handle, an abrasive cylinder comprising a pair of solid spools on said shaft and a resilient block between them, means for urging the spools toward each other to expand the resilient block and thereby releasably lock an abrasive sleeve on the spools for rotation with the shaft, and a flexible shaft secured to the end of the rigid shaft remote from the handle for driving connection to a portable electric drill whereby to permit the user to hold the abrasive cylinder generally parallel to his frontal plane and manipulate the sander with his arms and hands in natural, unstrained positions.

3,656,921
COATING GLASS PARTICLES WITH AN OXYGEN-CONTAINING COMPOUND TO PREVENT STICKING DURING HEATING

Oswin Burr Willcox, Landenburg, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 2, 1970, Ser. No. 42,856
Int. Cl. C03b *19/10, 29/00;* C09c *1/36*
U.S. Cl. 65—21 3 Claims

Glass particles are prevented from sticking to each other or to processing equipment when heated up to about the sintering temperature of the glass by maintaining on the surface of the glass particles at least a partial coating of at least one oxygen-containing compound having a melting point higher than that of the glass particles and present in the amount of at least 1 weight percent based on the weight of the glass particles.

3,656,922
MANUFACTURE OF GLASS CONTAINERS

Sydney Maurice Budd, Edgware, England, assignor to United Glass Limited, Staines, Middlesex, England

Filed Mar. 30, 1970, Ser. No. 23,996
Int. Cl. C03c *15/00, 17/00*
U.S. Cl. 65—30 12 Claims

A method of manufacturing glass containers, e.g., glass bottles, comprises the steps of:

a. forming the containers in a forming machine;

b. immediately thereafter, and while they are still hot from the forming, contacting the containers with a metal-organic compound in liquid form and of high thermal stability such that substantially no decomposition of the metal-organic compound takes place on contact;

c. subjecting the containers treated as in (b) to a heat treatment to cause the metal-organic compound to react with the glass and form a diffuse layer of reaction product within the glass surface; and

d. treating the containers while at a temperature of at least 450° with a metal compound in liquid or vapor form which decomposes rapidly on contact with the containers at the contacting temperature to produce a surface film of metal oxide.

Tin and titanium compounds are mentioned as suitable reagents, and steps (c) and (d) may take place simultaneously.

3,656,923
METHOD FOR STRENGTHENING PHOTOCHROMIC GLASS ARTICLES

Harmon M. Garfinkel, Horseheads; Loris G. Sawchuk, and Stanley D. Stookey, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

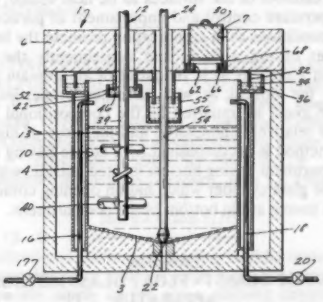
Filed May 27, 1968, Ser. No. 732,036
Int. Cl. C03c *15/00;* C03b *11/08;* C03c *3/00*
U.S. Cl. 65—30 15 Claims

This invention relates to the manufacture of glass articles which exhibit photochromic behavior and which exhibit very high mechanical strengths through the development of a surface compression layer therein by an ion exchange process. More particularly, this invention relates to glasses wherein silver halide crystals impart photochromic properties and wherein the ion exchange involves alkali metal and silver ions.

3,656,924
APPARATUS AND METHODS FOR MELTING GLASS COMPOSITIONS FOR GLASS LASER RODS

George C. Chapman, and James T. Le Sueur, both of Toledo, Ohio, assignors to Owens-Illinois, Inc.

Filed Nov. 17, 1969, Ser. No. 877,076
Int. Cl. C03b *5/18*
U.S. Cl. 65—32 17 Claims



Methods of melting and refining molten glass for the production of glass laser rods, the glass having a relatively high lithia content of at least about 8 mole percent, the glass being melted in a platinum lined furnace having a roof, sidewalls and a bottom having a discharge opening and a plunger adapted to open and close the opening. The method includes the steps of (1) charging into the furnace by means of a charge opening and a charge tube raw glass batch materials in the form of oxides, (2) melting the batch materials to form molten glass and refining the same, (3) providing an atmosphere of inert gas above the molten glass by a flow of gas into the atmosphere, and using the inert gas to purge any air from the furnace atmosphere during the charging of the raw batch materials, (4) stirring the molten glass with stirrers having platinum surfaces on the portion thereof exposed to the molten glass furnace atmosphere, (5) sealing the charge tube, the stirrers and the plunger with molten glass seals to prevent air from coming into the furnace atmosphere and to prevent condensation of platinum vapors to thereby eliminate deposits of platinum containing material in the molten glass which could cause platinum inclusions, and (6) charging the molten refined glass through the discharge

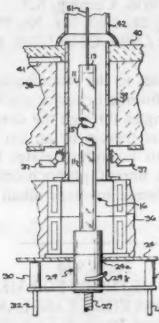
opening for the production of high quality glass laser rods having a minimum of platinum inclusions.

3,656,925

METHOD AND APPARATUS FOR JOINING TWO GLASS PARTS OR ARTICLES

Glenn H. Dunlap, Maumee, Ohio, assignor to Owens-Illinois, Inc.

Filed May 28, 1970, Ser. No. 41,284
Int. Cl. C03b *23/20*
U.S. Cl. 65—36 **7 Claims**



A process for heat sealing together two preformed glass articles preferably adapted to be nested one within the other by a technique which envisions a precise and careful conditioning and treatment of the surfaces to be heat sealed, coupled with temperature control and impressment of particular low pressure conditions as in combination promote the heat sealing joinder of the surfaces and consequently the articles together in a manner as is yieldative of an ultimate produce in which the optical as well as other properties of the preformed glass, as imparted by the compositional makeup thereof, is relatively unimpaired and therefore of high quality. This method is accomplished by a device having an elongate compartment having heaters located outside, with a base to hold the glass cylinder which has an opening connected to a vacuum source at the bottom of the compartment.

3,656,926

COATING OF GLASS IN FLOAT GLASS METHOD AND APPARATUS

David Gordon Loukes, Eccleston Park, Prescot, and Alan Edwards, Widnes, both of England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England

Filed June 26, 1969, Ser. No. 836,712
Claims priority, application Great Britain, June 24, 1968, 29,998/68
Int. Cl. C03b *18/00*; **C03c** *17/00*
U.S. Cl. 65—60 **17 Claims**

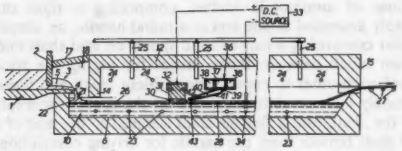
Glass is coated with, for example a metal or oxide coating, by releasing towards the glass surface a vaporized material for coating the glass, and by regulating the temperature of the glass relative to the temperature of the vapor the glass surface is made receptive to a coating of the vaporized material which condenses on the glass surface. The coating material, for example a body of molten silver, is located adjacent the upper surface of the glass by a locating member extending transversely across the glass width. The locating member is connected to the terminals of an electric circuit to heat the silver and cause vaporization thereof, the vaporized particles being received by the glass surface.

3,656,927

METHOD AND APPARATUS FOR FLOAT GLASS MANUFACTURE

Jack Lawrenson, and David Jones, both of St. Helens, England, assignors to Pilkington Brothers Limited, Liverpool, Lancashire, England

Filed Mar. 17, 1969, Ser. No. 807,516
Claims priority, application Great Britain, Mar. 27, 1968, 14,809/68
Int. Cl. C03b *18/00*
U.S. Cl. 65—99 A **8 Claims**



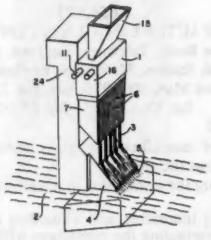
The surface of glass is modified by migration of an element from a molten electrically conductive body into the glass, and a continuous gaseous flow in the vicinity of the glass surface emerging from contact with the molten body removes harmful vapors originating from the molten body. The gaseous flow is induced by directing a laterally elongated opening toward the glass surface and the molten body, and causing gas to be either sucked into the opening or emitted therefrom to create a gas flow longitudinally of the glass surface.

3,656,928

PROCESS FOR CONTINUOUSLY INCORPORATING MODIFIERS INTO MOLTEN GLASS

German Artigas Gimenez, Aviles, Spain, assignor to Saint-Gobain, Neuilly-sur-Seine, France

Filed Feb. 24, 1970, Ser. No. 13,386
Claims priority, application France, Feb. 21, 1969, 6904440
Int. Cl. C03b *5/26, 5/16*
U.S. Cl. 65—121 **5 Claims**



Solid particulate material such as colorant to be added to and homogenized with molten glass in a melting furnace, is deposited into a reservoir over and subjected to the hot atmosphere of the furnace and thereby melted. The molten material or additive flows continuously from the reservoir in a plurality of small filaments which fall onto a smooth inclined planar surface of heat resistant material dipping into the molten glass. On the planar surface the filaments spread

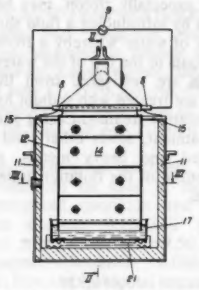
out into a smoothly and downwardly flowing stream of uniform minute thickness which passes into the molten glass without turbulence and without entrainment of air bubbles. If required, additional heating means for the solid particulate additive or frit, may be provided.

3,656,929

FALLING FILM COOLING OF MOLTEN GLASS

Colin T. Gildea, Parbold near Wigan, England, assignor to Pilkington Brothers Limited, Liverpool, Lancashire, England

Filed May 12, 1969, Ser. No. 823,594
Claims priority, application Great Britain, May 29, 1968, 25,798/68
Int. Cl. C03b 17/00
U.S. Cl. 65—129 9 Claims



Molten glass is thermally conditioned by allowing it to run through a slit onto a metal film supporting member, such as a platinum plate or screen, the glass running into a falling curtain of glass running down the supporting member. The faces of the supporting member are enclosed within, opposed to and spaced from the radiant-heat absorbing walls of a chamber and are supported on a frame. The chamber walls having heating elements which are controlled to regulate the temperature of the walls and thereby control the temperature of the pool of molten glass collected at the bottom of the film supporting member.

3,656,930

MOSS PEAT CAKE FOR HORTICULTURE

James Martin, Dublin, Ireland, assignor to Bord NA Mona, Dublin, Ireland

Continuation of application Ser. No. 665,997, Sept. 7, 1967, now abandoned. This application Sept. 22, 1970, Ser. No. 74,530
Int. Cl. C05f 11/02
U.S. Cl. 71—24 5 Claims

Peat moss is prepared in the form of coherent cakes by drying granulated moss peat until the moisture content thereof is reduced to 10 to 30 percent by weight, and then compressing the thus-dried moss peat in a mold at a pressure between 1 and 4 British tons/in.^{2} until upon releasing the pressure the moss peat has the form of a cake having between one-sixth and one-twelfth its bulk size before compression. The coherent cake is easily reconstituted by wetting, and to this end may include a non-ionic wetting agent.

3,656,931

PREPARATION OF AMMONIUM ORTHO-PHOSPHATE AGRICULTURAL SUSPENSIONS

William B. Dancy, Lakeland, Fla., assignor to International Minerals & Chemical Corporation

Filed Aug. 26, 1968, Ser. No. 755,395
Int. Cl. C05b 7/00, 9/00, 13/00
U.S. Cl. 71—33 8 Claims

Wet process phosphoric acid containing iron, aluminum or magnesium compounds as impurities is ammoniated to produce an ammonium phosphate having a gelatinous, colloidal component of iron, aluminum or magnesium ammonium phosphate, the ammonium phosphate is heated to dehydrate the gel structure under conditions to prevent the formation of polyphosphates, and the dried material is comminuted to finely divided particles that produce a stable aqueous suspension when dispersed in water. A water soluble magnesium compound may be added to the phosphoric acid, thereby providing magnesium ammonium phosphate in the product.

3,656,932

PROCESS FOR CONTROLLING UNDESIRED VEGETATION

Horst Scheuermann, Ludwigshafen am Rhine, and Adolf Fischer, Mutterstadt am Pfalz, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen and Rhineland-Pfalz, Germany

Filed Sept. 6, 1968, Ser. No. 758,103
Claims priority, application Germany, Sept. 15, 1967, P 16 42 231.4
Int. Cl. A01n 9/20
U.S. Cl. 71—105 6 Claims

A process for controlling undesired vegetation, in particular, a process for controlling undesired vegetation without damaging crop plants using substituted esters of N-phenylaminoacrylic acid.

3,656,933

ROASTING MATERIALS CONTAINING ROASTABLE SULFUR WITH ARSENIC AND/OR ANTIMONY

Herbert Wolf, Bad Duerkheim, and Wilhelm Goesele, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed June 3, 1969, Ser. No. 830,129
Claims priority, application Germany, June 12, 1968, P 17 67 753.1
Int. Cl. C22b 1/10
U.S. Cl. 75—9 2 Claims

A fluidized-bed method of roasting sulfidic materials containing arsenic and/or antimony with a gas containing oxygen with separate supply of the gas containing oxygen for the preroasting in a first stage and for the afterroasting in the second stage and with separate withdrawal of the roaster gas from the preroasting stage and from the afterroasting stage. The dusty portion of the roasted intermediate product from the first stage is introduced periodically into the fluidized bed of the second stage and, in timed relationship with this periodic introduction of the roasted intermediate product, air is periodically introduced into the gas space above the fluidized bed in the second layer in such an amount that it is adequate for complete roasting of the dusty roasted intermediate products suspended in this gas space.

3,656,934

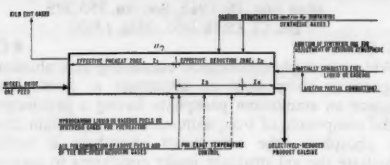
ROTARY KILN REDUCTION OF LIMONITIC ORES

Walter Curlook, Neuilly, France, and James Alexander Evert Bell, Port Colborne, Ontario, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Mar. 12, 1970, Ser. No. 18,890
Claims priority, application Canada, May 28, 1969, 047216
Int. Cl. C22b 23/02, 5/18
U.S. Cl. 75—82 5 Claims

Directed to the reduction of nickel-containing lateritic ores in a rotary kiln at high production rates to achieve selective

reduction of nickel contained in the ore wherein the ore is preheated to at least about 1,000° F. in a preheating zone in the kiln and is maintained at at least this temperature while it travels through the reduction zone and wherein within the



reduction zone the preheated ore is first subjected to a strongly reducing atmosphere and is then subjected to a moderately reducing atmosphere adjacent the discharge end of the kiln.

3,656,935

PROCESS FOR RECOVERING NICKEL FROM NICKEL ORES

Iwao Iwasaki, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Apr. 24, 1970, Ser. No. 31,759
Int. Cl. C22b *23/02*
U.S. Cl. 75—82 **9 Claims**

This invention provides a process for the treatment of nickel ores whereby the comminuted feed ore is mixed with a halide and an oil and the mixture is maintained at a temperature and for a length of time sufficient to metallize the nickel in the ore by the migration of the nickel from its finely dispersed state in the feed ore to aggregate in the form of globules of iron-nickel alloy. This permits the subsequent recovery and concentration of the nickel by magnetic separation and by other conventional physical separation procedures. By the application of this process the nickel present in very low grade nickel ores and in ores of a complex nature may be recovered and concentrated.

3,656,936

VANADIUM RECOVERY PROCESS

Frank C. Haas, Arvada, Colo., assignor to The Oil Shale Corporation, New York, N.Y.

Filed Oct. 14, 1970, Ser. No. 80,778
Int. Cl. C22b *55/00*
U.S. Cl. 75—101 R **8 Claims**

A process is provided for recovering vanadium values from highly alkaline, calcium-rich calcines, which are usually the roasted product of low-grade vanadium-bearing calcitic ores. The process involves slurrying the calcine in water and carbonating the slurry to a pH of 5.0 to 9.0 to extract the soluble vanadium species from the slurry. A basic anion exchange resin is added to the carbonated slurry thereby increasing the vanadium recovery by shifting the extraction equilibrium.

3,656,937

PROCESS FOR TREATMENT OF MATTES AND SULPHURATED NICKEL CONCENTRATES

Louis Gandon; Roger Jean, and Philippe Lenoble, all of Le Havre, France, assignors to Le Nickel, Paris, France

Filed Oct. 3, 1969, Ser. No. 863,569
Claims priority, application France, Oct. 21, 1968, 170692
Int. Cl. C22b *23/04*
U.S. Cl. 75—101 R **3 Claims**

Nickel containing concentrates, particularly nickel matte, containing by weight 55 to 75 percent nickel, 10 to 40 percent sulphur and a minor proportion of secondary metals in powder or pulp form are subjected to an oxidizing lixiviation with nitric acid preferably in the presence of oxygen, nitrous vapors formed being regenerated to nitric acid and recycled. The solution from the oxidizing lixiviation is sulphated to substantially replace nitrate by sulphate; secondary metals, in particular iron, copper and cobalt are removed and pure hydrated nickel sulphate is crystallized from the solution. Preferably nickel hydroxide and carbonate are precipitated from the mother liquor from the crystallization of nickel sulphate and are used in the removal of iron and cobalt.

3,656,938

TREATMENT OF BITUMINOUS SANDS FOR RECOVERY OF HEAVY METALS THEREFROM

Stephen Penzes, Edmonton, Alberta, Canada, assignor to Canada Cities Service, Ltd., Alberta, Canada; Imperial Oil Limited; Atlantic Richfield Corporation and Royalite Oil Company, Limited, part interest to each

Filed Dec. 19, 1969, Ser. No. 886,746
Int. Cl. C22b *61/02*
U.S. Cl. 75—101 **4 Claims**

Heavy metals, especially zircon, may be recovered from bituminous sands by introducing a fluid slurry of bituminous sand into a body of water whereby a froth containing bitumen and solids floats to the top of the water and is recovered therefrom. Solids are recovered from this froth and the recovered solids are treated with sodium hydroxide and then subjected to a flotation treatment using aeration gas. During the flotation treatment, solids other than heavy metal are selectively floated and heavy metals, especially zircon, remain in the bottom of the flotation zone from which they may be recovered.

3,656,939

RECOVERY OF PALLADIUM FROM RINSE WATER

Dennis R. Boehm, Grand Rapids, and Kenneth R. Hampel, Grandville, both of Mich., assignors to Gulf & Western Industrial Products Company, Grand Rapids, Mich.

Filed July 20, 1970, Ser. No. 56,707
Int. Cl. C22b *11/04*
U.S. Cl. 75—108 **6 Claims**

A process for the essentially total removal of palladium cations in a cation exchange resin bed, followed by removal of chloride and palladium chloride anions in an anion exchange bed. Recovery of the precious metal is effected by mixing the solutions used to regenerate the ion-exchange beds in such proportion as to maintain a pH of less than 6 for the mixture, then adding a reducing agent to the precipitate palladium to the substantial exclusion of all other metals.

3,656,940

PROCESS FOR THE PURIFICATION OF NICKEL CONTAINING SOLUTIONS

Louis Gandon; Roger Jean, and Philippe Lenoble, all of Le Havre, France, assignors to Le Nickel, Paris, France

Filed June 5, 1969, Ser. No. 830,883
Claims priority, application France, June 21, 1968, 156168
Int. Cl. C22b *23/04*
U.S. Cl. 75—119 **6 Claims**

Aqueous solutions containing nickel can be purified of metals capable of forming anionic complex chlorides, particularly, iron and cobalt, by raising the chloride content of the solution to from 2N to 6N by adding a completely dissociated salt of hydrochloric acid followed by contacting the solution with an anion exchange resin at a temperature above 20° C. The process is particularly suitable for purifying the anolyte from an electrolytic process for the purification of ferro-nickel or nickel matte, the purified nickel containing solution being recycled to form the catholyte.

3,656,941

HYDROMETALLURGICAL TREATMENT OF SILICEOUS ZINC ORES

Ian George Matthew, Moonah, and Dagwin Elsner, Sandy Bay, both of Australia, assignors to Electrolytic Zinc Company of Australasia Limited, Melbourne, Victoria, Australia

Filed Mar. 4, 1969, Ser. No. 804,259
Claims priority, application Canada, Mar. 13, 1968, 34922/68
Int. Cl. C22b *23/04*
U.S. Cl. 75—119 2 Claims

A process for the recovery of metal values from a siliceous zinc ore whereby the ore is treated with aqueous sulfuric acid in a continuous manner in a first and second stage, in at least two stirred vessels. The ore is leached to an end point pH in the range of 1.5–2.5 over a period of 1–6 hours in the first stage yielding a pulp which is continuously transferred to the second stage where the pH is held to 4.9–5.3 for a period of 1–14 hours, yielding a readily filterable pulp.

3,656,942

STEEL FOR LOW-TEMPERATURE SERVICE

Akira Kambayashi, and Shun-Ichi Shimada, both of Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Kawasaki-shi, Kanagawa-ken, Japan

Filed June 17, 1970, Ser. No. 47,155
Claims priority, application Japan, June 21, 1969, 44/48793
Int. Cl. C22c *39/02, 39/36*
U.S. Cl. 75—124 12 Claims

A steel having excellent notch toughness, for service at low temperatures, which can be used in the normalized or hardened and tempered condition and which contains 0.4–0.13 percent Carbon, 0.15–0.30 percent Silicon, 0.30–0.90 percent Manganese, 8.50–9.50 percent Nickel, 0.020–0.060 percent Aluminum, 0.008–0.020 percent Nitrogen. Balance, Iron and incidental impurities.

3,656,943

METHOD OF WELDING AND MATERIAL FOR USE IN PRACTICING METHOD

Julius Heuschkel, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 541,899, Mar. 18, 1966, now abandoned, which is a continuation-in-part of application Ser. No. 223,143, Sept. 12, 1962, now abandoned. This application Nov. 13, 1967, Ser. No. 682,348
Int. Cl. C22c *39/20*
U.S. Cl. 75—128 A 25 Claims

An alloy-steel filler material for arc welding to produce welds of high toughness over a temperature range from −200° F to +200° F and of tensile strength exceeding 100,000 pounds per square inch whose principal alloying components are carbon, manganese, nickel, chromium, molybdenum, vanadium and tungsten, in combination with low phosphorus, sulfur, silicon, nitrogen and oxygen and a weld of high toughness over the above temperature range and of tensile strength exceeding 100,000 lbs. per square inch having the above alloying components also in combination with low phosphorus, sulfur, silicon, nitrogen and oxygen.

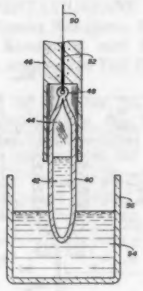
3,656,944

METHOD OF PRODUCING HOMOGENEOUS INGOTS OF A METALLIC ALLOY

Maurice J. Brau, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 16, 1970, Ser. No. 11,644
Int. Cl. C22c *1/00*
U.S. Cl. 75—135 10 Claims

A method for producing homogeneous ingots of an alloy in which one of the components thereof has a high vapor pressure includes the step of sealing the desired alloy components in a quartz ampoule sufficiently large to include a vapor space therein and heating the ampoule and its contents to at least a temperature at which the components will form a homogeneous liquid mixture. An example of an alloy which can be produced by the instant process is an alloy of cadmium, mercury and tellurium. The method of this invention also includes the steps of quenching the homogeneous alloy from the liquid to the solid state while maintaining a relatively high vapor pressure in the vapor space in the ampoule above the space occupied by the alloy. The high vapor pressure can be maintained in the vapor space by thermally insulating the vapor space during the quenching step. The preferable form of quenching is by immersing only a portion of the space occupied by the alloy in a quenching bath, for example, a quenching oil.

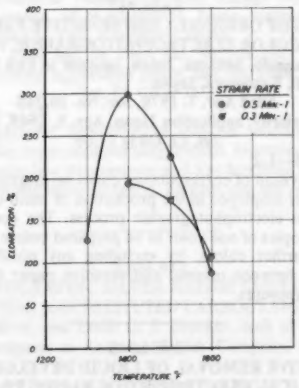


3,656,945

HIGH STRENGTH ALUMINUM BRONZE ALLOY

George H. Eichelman, Jr., Cheshire, Conn., assignor to Olin Corporation

Filed June 11, 1970, Ser. No. 45,441
Int. Cl. C22c *9/00, 9/06;* C22f *1/08*
U.S. Cl. 75—162 19 Claims



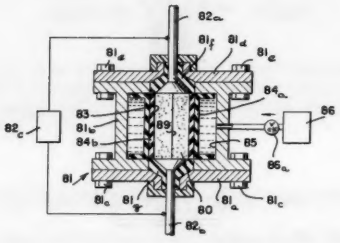
A high strength aluminum bronze alloy consisting essentially of 8.0 to 11.8 percent aluminum, 0.05 to 2.0 percent zirconium, 0.5 to 4.0 percent cobalt, 0.1 to 2.0 percent manganese, balance essentially copper, wherein the alloy has a metallographic structure containing 5 to 100 percent beta phase, remainder alpha phase, with a uniformly fine metallographic grain structure with a grain size of less than 0.065 mm., and a method of obtaining exceptional formability in these alloys.

3,656,946

ELECTRICAL SINTERING UNDER LIQUID PRESSURE

Kiyoshi Inque, and Shinroku Saito, both of Tokyo, Japan, assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Mar. 4, 1968, Ser. No. 710,219
Claims priority, application Japan, Mar. 3, 1967, 42/13622
Int. Cl. B22f 3/14
U.S. Cl. 75—226 19 Claims



A method of electrical sintering of a mass particles of conductive or nonconductive powder in which the powder is compacted between the electrode by means of liquid pressure applied through a flexible membrane. The fluid pressure may be supplied within the body or from the outside and may follow the shrinkage of the mass which can be spark sintered or fused by resistance heating. An elongated element can bridge the electrodes for retention in the mass to form a reinforcing member or can serve as an auxiliary heating element. The body thereby sintered can be surrounded by a lightly compacted, porous layer of a heat resistant material (e.g., graphite) to form a force-transmitting medium between the membrane in the sinterable mass.

3,656,947

CODING OF ORIGINALS AND SENSITIVE PAPER IN A MULTI-COLOR ELECTROPHOTOGRAPHIC PROCESS

Seiji Matsumoto, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 7, 1970, Ser. No. 26,348
Claims priority, application Japan, Apr. 8, 1969, 44/27048
Int. Cl. G03g 13/00
U.S. Cl. 96—1.2 4 Claims

The provision of corresponding codes on originals and sensitive paper employed in the production of multi-colored copies by an electrophotographic process. The codes enable multiple copies of one color to be prepared before incorporation of further colors, by excluding any possibility of a mismatch between original and sensitive paper during subsequent exposures.

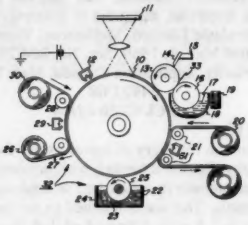
3,656,948

SELECTIVE REMOVAL OF LIQUID DEVELOPER IN A CYCLICAL ELECTROPHOTOGRAPHIC PROCESS

Joseph Mammino, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Nov. 20, 1969, Ser. No. 878,495
Int. Cl. G03g 13/22
U.S. Cl. 96—1.4 14 Claims

An electrostatographic imaging surface is cleaned of liquid developer by selectively applying to the charged or image areas of the imaging surface a finely divided, dry, absorbent powder. The powder may be selectively applied by charging the powder to a polarity opposite that which the imaging surface bears and presenting a charged powder loaded applicator adjacent the imaging surface such that the charged



powder is transferred to the imaging surface with an electrostatic assist from the residual charge on the imaging surface.

3,656,949

METHOD OF PRODUCING AN ELECTROPHOTOGRAPHIC AND ELECTROGRAPHIC RECORDING MEMBER

Satoru Honjo, and Nobuo Tsuji, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed June 10, 1969, Ser. No. 831,879
Claims priority, application Japan, June 10, 1968, 43/39800
Int. Cl. G03g 5/00
U.S. Cl. 96—1.5 17 Claims

Improved process for producing electrophotographic/electrographic recording members wherein prior to coating the recording layer the substrate is subbed with an aqueous coating mixture prepared by dissolving a water soluble, film forming polymeric material in an aqueous solvent system and mixing therein an aqueous emulsion of a water-insoluble polymeric material which is incompatible with the first polymeric material. The resulting subcoating forms a continuous film whereby the penetration of organic solvents are prevented into the substrate. Surface resistivity of the subbing layer does not exceed 10^{10} ohms/sq. at 40 percent relative humidity and room temperature.

3,656,950

COLOR PHOTOGRAPHIC PROCESSES

Richard L. Bent, and Rowland G. Mowrey, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 3, 1970, Ser. No. 94,993
Int. Cl. G03c 7/30, 7/32; C07c 87/58
U.S. Cl. 96—22 9 Claims

Color development processes with aqueous alkaline color developing compositions containing a 3-alkyl-N-alkyl-N-alkoxyalkyl-p-phenylenediamine color developing agent or a 3-alkoxy-N-alkyl-N-alkoxyalkyl-p-phenylenediamine color developing agent are advantageously used to produce good color reproductions with image dyes of superior stability to prolonged exposure to heat, humidity and/or light in multilayer, multicolor photographic elements coated on opaque supports and containing 65 mg to 375 mg of silver chlorobromide per m^2 in at least the red-sensitive layer and the green-sensitive layer.

3,656,951

PHOTORESIST COMPOSITIONS

Richard M. Anderson, and Robert A. Heinsch, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 2, 1970, Ser. No. 15,856
Int. Cl. G03c 1/68, 1/70
U.S. Cl. 96—35.1 29 Claims

Photosensitive resist compositions comprising an alkene polymer, solvent soluble and solid at ambient temperatures, a

photosensitive halogen compound sensitizing agent and a metal organic compound and methods of photomechanical reproduction using such compositions on substrates such as metals, ceramics, glass, and wafers for producing printed circuit boards, integrated circuits, printing plates, chemically milled parts and shapes and the like.

3,656,952

NON-REVERSAL IMAGING PROCESS AND RECORDING ELEMENTS PRODUCED THEREBY

Richard A. Miller, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed July 19, 1968, Ser. No. 745,976
Int. Cl. G03c *5/24*
U.S. Cl. 96—48 PD **14 Claims**

A non-reversal imaging process wherein a recording element having a layer of a photosensitive composition which upon light exposure produces light-generated nuclei of a metal more noble than silver, i.e. Pd, Pt, Au, is exposed to an image. The exposed element is treated with a solution of trimethylamine borane, triethylamine borane, t-butylamine borane, pyridine borane, morpholine borane, sodium borohydride, lithium aluminum hydride or hydrazine to generate in the unexposed areas of the layer chemically reduced metal nuclei which are more highly catalytic to the electroless deposition of a non-noble metal than the light generated nuclei. Non-noble metal is then electrolessly plated selectively on the chemically reduced nuclei to produce a non-reversed image.

3,656,953

SILVER DYESTUFF BLEACHING PROCESS USING QUINOXALINE CATALYST

Hans-Peter Schlunke, Marly-le-Petit, and Karl Ronco, Riehen, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 3, 1970, Ser. No. 16,207
Claims priority, application Switzerland, Mar. 13, 1969, 3820/69
Int. Cl. G03c *7/00*
U.S. Cl. 96—53 **16 Claims**

A process for the manufacture of color photographic images according to the dyestuff bleaching process is provided. In this process the dyestuff bleaching is carried out in the presence of a dyestuff bleaching catalyst which is a quinoxaline substituted in the 2- and 3-positions by alkyl or aryl groups and also the benzene nucleus may be further substituted. These quinoxalines possess a good activity and effect an advantageous gradation.

3,656,954

PHOTOGRAPHIC MATERIAL WITH IMPROVED SURFACE PROPERTIES

Robrecht Julius Thiers, Brasschaat, and Jozef Frans Willems, Wilrijk, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Aug. 26, 1969, Ser. No. 853,211
Claims priority, application Great Britain, Mar. 17, 1969, 13,884/69
Int. Cl. G03c *1/76*
U.S. Cl. 96—67 **19 Claims**

Photographic materials comprising a support, a light-sensitive silver halide emulsion layer on said support and thereover a hydrophilic colloidal protective coating is described. The photographic material will include resorcin in the emulsion layer and a poly-N-vinyl lactam or polyvinyl lactone in the emulsion layer or in the protective surface coating. The surface coating will include silica particles and a polycarbocyclic aromatic sulphonic acid or water-soluble salt thereof.

The photographic material is free or substantially free from milkiness or cloudiness normally associated with photographic materials comprising resorcin, polyvinyllactam or polyvinyllactone, and silica.

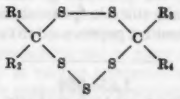
3,656,955

SILVER HALIDE EMULSION SENSITIZED WITH PENTATHIEPANE

Yoshuke Ushimaru; Yosuke Nakajima; Mitsunori Sugiyama; Fumihiko Nishio, Kanagawa, and Shigeru Kobayashi, Osaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 28, 1970, Ser. No. 68,041
Claims priority, application Japan, Aug. 28, 1969, 44/68219
Int. Cl. G03c *1/28*
U.S. Cl. 96—107 **9 Claims**

A photosensitive silver halide photographic emulsion containing at least one compound selected from the group consisting of compounds having the formula



wherein each of R_1, R_2, and R_3 and R_4 is selected from the group consisting of a hydrogen atom, an alkyl group and an aralkyl group; and wherein R_1 and R_2, or R_3 and R_4 can combine to form a cycloalkyl group, is disclosed.

3,656,956

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Nobuo Yamamoto; Fumihiko Nishio; Masaji Yoshida, and Hideo Kawano, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 30, 1969, Ser. No. 795,330
Claims priority, application Japan, Jan. 30, 1968, 43/5558
Int. Cl. G03c *1/72*
U.S. Cl. 96—114 **14 Claims**

A photographic light-sensitive material wherein at least one emulsion layer contains polyglycidol. Improved stress resistance under low temperature and low humidity conditions is illustrated and desensitization, fogging, etc. are reduced.

3,656,957

PHOTOGRAPHIC SILVER HALIDE EMULSIONS CONTAINING K-SUBSTITUTED CARBOCYANINE DYES

Gene L. Oliver, and Leslie G. S. Brooker, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 3, 1970, Ser. No. 25,549
Int. Cl. G03c *1/10*
U.S. Cl. 96—127 **6 Claims**

An extensive range of μ-substituted carbocyanine dyes are prepared by reacting a μ-chloro-carbocyanine dye with a reagent having a reactive nucleophilic residue which replaces the μ-chloro substituent. The dyes which can be so prepared include novel dyes wherein the reactive nucleophilic residue is less nucleophilic than those presently employed. The resultant novel dyes are useful as coloring materials and as spectral sensitizers for photographic silver halide.

3,656,958

SILVER HALIDE EMULSIONS CONTAINING CARBOXY-ALKYL THIAZOLE OR SELENAZOLE RHODANINE MEROCYANINE SENSITIZING DYES

Henri Depoorter, Mortsel, Belgium, and Oskar Riester, Leverkusen, Germany, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Mar. 23, 1970, Ser. No. 22,006
Claims priority, application Great Britain, Apr. 10, 1970, 18,508/69
Int. Cl. G03c 1/08
U.S. Cl. 96—139 6 Claims

Thiazole and selenazole rhodanine merocyanine dyes are provided which comprise in the 4,5-positions of the thiazole or selenazole nucleus at least one carboxy-substituted alkyl or aralkyl group, a 4,5-carboxy-alkylene or 4,5- carboxyalkyl-alkylene group or a fused-on arylene nucleus carrying a carboxy-substituted alkyl or aralkyl group, the carboxy group being either in its free acid form or in its salt form. These dyes in photographic silver halide emulsions provide superior sensitizing action in the blue region of the spectrum so that they are extremely suitable for increasing the blue-sensitivity of silver halide emulsions. Their sensitizing action is not adversely affected by the presence of color couplers, which makes them especially suitable for sensitizing the blue-sensitive layer of light-sensitive papers used in color photography.

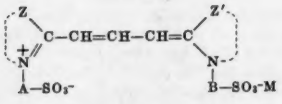
3,656,959

PHOTOGRAPHIC SILVER HALIDE EMULSION

Shiro Kimura; Yoshiyuki Nakazawa; Akira Sato, and Yasuharu Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 27, 1968, Ser. No. 755,745
Claims priority, application Japan, Aug. 29, 1967, 42/55439
Int. Cl. G03c 1/10
U.S. Cl. 96—127 7 Claims

A photographic silver halide emulsion containing at least one unsymmetrical benzimidazolocarbocyanine sensitizing dye represented by the general formula:



Z and Z′ are non-metallic groups necessary to complete a benzimidazole nucleus, A and B are polymethylene groups or alkylpolymethylene groups, and M is a cation. Preferred dyes are set out in the specification.

3,656,960

PHOTOGRAPHIC SILVER HALIDE EMULSIONS CONTAINING μ-CHLOROCARBOCYANINE DYES

Gene L. Oliver, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 3, 1970, Ser. No. 25,550
Int. Cl. G03c 1/18
U.S. Cl. 96—134 5 Claims

Meso-Carbocyanine dyes having a chloro-substituent in the meso-position (such as 9-chloro-3,3′-diethylthiacarbocyanine chloride) are useful as photographic silver halide sensitizing dyes. They can be prepared by condensing two heterocyclic quaternary salts, of the types used in preparing cyanine dyes, which are salts of non-nucleophilic anions and which are substituted, at the nuclear position desired for attachment to the intervening trimethine chain, with substituents such as chloro and 2-(2-chloropropenyl) substituent respectively.

3,656,961

DIRECT POSITIVE SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENTS

Yoshihide Hayakawa, Saitama; Hideo Kawano, Kanagawa, and Hirotetu Kato, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 7, 1970, Ser. No. 1,302
Claims priority, application Japan, Jan. 25, 1969, 44/5582
Int. Cl. G03c 1/28
U.S. Cl. 96—108 14 Claims

A light-sensitive, direct positive, photographic silver halide element comprising a support having thereon a silver halide emulsion layer containing a salt selected from the group consisting of a soluble salt and a complex salt of a metal belonging to Group 8 of the periodic table and a condensed polycyclic quinone compound.

3,656,962

SILVER HALIDE EMULSION CONTAINING LEAD OXIDE AS OPTICAL SENSITIZER

Boris Levy, Wayland, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 22, 1970, Ser. No. 74,380
Int. Cl. G03c 1/02
U.S. Cl. 96—120 8 Claims

Spectral sensitization of silver halides dispersed in a colloid binder is achieved by providing orthorhombic lead oxide in intimate physical contact with the silver halide crystals.

3,656,963

HYDROLYZED PROTEIN OF REDUCED DUSTINESS AND PROCESS

William D. Roberson, Harbor Beach, Mich., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 22, 1969, Ser. No. 868,621
Int. Cl. A23l 1/22
U.S. Cl. 99—14 3 Claims

A relatively dustless substantially dry composition including hydrolyzed protein and, as a dust proofing agent, a polyoxyethylene sorbitan monoester of a fatty acid, and process of preparing said composition.

3,656,964

SOLUBLE COFFEE PROCESS

Michael H. Mansky, Upper Montclair, N.J., and Esra Pitchon, Flushing, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,497
Int. Cl. A23f 1/08
U.S. Cl. 99—71 12 Claims

A process for producing a soluble coffee has been discovered in which a unique use of standard percolation columns results in an improved process. The process involves using two fresh columns, volatile aromatics being stripped from one fresh column and taking a double draw-off from every other fresh column in order to obtain a steeper concentration gradient in the resultant extract. The extract is split into high and low concentration portions and subjected to further processing.

3,656,965

PROCESS AND APPARATUS FOR CONTROLLING THE EXPANSION OF PUFFABLE MATERIALS

Palmer K. Strommer; Kenneth J. Valentas, and Herbert Neal Dunning, all of Minneapolis, Minn., assignors to General Mills, Inc.

Filed June 2, 1969, Ser. No. 829,550
Int. Cl. A23l 1/18
U.S. Cl. 99—81 18 Claims

A process and apparatus for forming a puffed product from particles of a puffable material. The volumetric expansion and the bulk density of the particles is controlled or

limited, by applying a fluid medium onto the particles at, or proximate, the discharge opening where the particles are discharged from a high pressure producing apparatus.

3,656,966
FOOD CHIP AND PROCESS FOR MAKING IT
Murray E. Ball, Rockford, and LeRoy M. Demeny, St. Paul, both of Minn., assignors to General Mills, Inc.
Continuation-in-part of application Ser. No. 680,826, Nov. 6, 1967, now abandoned. This application Mar. 25, 1970, Ser. No. 22,481
Int. Cl. A23l *1/10, 1/18*
U.S. Cl. 99—83 **11 Claims**

A process for making a ready-to-eat food chip from cereal grain such as wheat or rye, by cooking a mixture of whole wheat, or whole rye, which has been cut into pieces, water, flavoring ingredients, and a small amount of another grain such as rice if desired, thereby forming a dough, shaping the dough into pieces or chips, drying the pieces, expanding or puffing the pieces by deep fat frying them in oil, and dusting the resulting chips with salt.

3,656,967
PROCESS FOR PREPARING A BAKED TWO-PHASE PRODUCT
Ralph L. Barton, Battle Creek, Mich., and John C. Erwin, St. Anne, Ill., assignors to General Foods Corporation, White Plains, N.Y.
Continuation of application Ser. No. 526,646, Dec. 21, 1965, now abandoned. This application Jan. 21, 1970, Ser. No. 4,792
Int. Cl. A21d *13/08*
U.S. Cl. 99—86 **1 Claim**

A food comestible comprised of a humectant-containing filling enveloped in a baked dough crust, the relative moisture equilibriums of the crust and the filling being such that moisture is transferred from the dough to the filling when the comestible is heated.

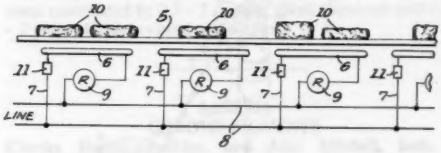
3,656,968
PROCESS FOR MAKING FOOD SANDWICH
Donald F. Allen, Racine, Wis., assignor to Ki-Ada of America, Inc., Racine, Wis.
Filed July 14, 1969, Ser. No. 841,497
Int. Cl. A21d *13/00*
U.S. Cl. 99—87 **4 Claims**

Preparation of a food sandwich consisting of a filling in a thin-walled bun with a hole extending into the bun along and adjacent to the filling so that flavoring material inserted into the hole will be in contact with the filling. A thin sheet of dough is wrapped around the filling and an adjacent skewer so that one end of the skewer protrudes from the dough. After cooking, the skewer is removed to produce the hole for the flavoring material.

3,656,969
BREADED VEGETABLE METHOD
Herbert Horn, Mattoon, Ill., assignor to Horn's Poultry, Inc.
Filed Nov. 3, 1969, Ser. No. 873,498
Int. Cl. A23l *1/12;* **A23b** *7/04*
U.S. Cl. 99—100 **1 Claim**

A breaded vegetable product, such as breaded pearl onion, is provided by covering the outer surface of a water-wet vegetable with wheat flour and applying a first coating of adherent batter. A fine breader is applied over the first batter coating and then a second batter coating is applied, e.g., by dipping. A final application of coarse breader is applied over the second batter coating and the coated vegetable is dried or permitted to dry and then laced on a stick, e.g., a bamboo skewer, and the combination is then frozen. The frozen product can be stored in frozen condition and later taken from storage and deep fat fried to produce a tasty snack.

3,656,970
STEAK-PREPARING AND BROILING METHOD
Ross C. Wood, 433 California St., El Segundo, Calif.
Filed Aug. 28, 1969, Ser. No. 853,689
Int. Cl. A22c *18/00*
U.S. Cl. 99—107 **4 Claims**



A method for preparing a plurality of steaks or similar cuts of meat, as well as hamburgers and other ground meat patties, that consist in first drenching the same in cooking oil to seal the surfaces, preheating one or more of the several items of such a plurality at various temperatures and maintaining all of them at such preheated temperatures during the same time period, seasoning, marinating and otherwise treating all of said items similarly or, selectively, in different manners, and finally broiling or otherwise cooking all of the items under similar cooking conditions for the same cooking period so that all of the items will be cooked to the different consistencies varying with the preheating temperatures and may be served at the same time.

3,656,971
LOW DENSITY FROSTINGS
George R. Reimer, 4709 Winnetka Ave. N., Minneapolis, Minn.
Filed Jan. 30, 1970, Ser. No. 7,245
Int. Cl. A23g *3/00*
U.S. Cl. 99—139 **9 Claims**

Dry creme frosting mix having a density of about 0.55 to 0.75 gm./cc and a lower level of sweetness than presently available frostings.

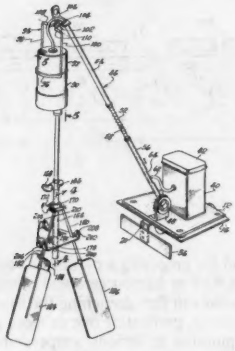
3,656,972
WHIP TOPPING
Erwin L. Blomberg, Minneapolis, Minn., assignor to General Mills, Inc.
Filed Mar. 23, 1970, Ser. No. 22,084
Int. Cl. A23g *3/00;* **A23l** *1/14*
U.S. Cl. 99—139 **3 Claims**

A dry creamy topping composition which can be reconstituted and hand whipped to make a whipped creamy topping or frosting in less than a minute. The composition comprises a whipping component, sucrose and a pregelatinized starch.

3,656,973
NON-NUTRITIVE FUNCTIONAL SUGAR SUBSTITUTE
Richard M. L. Paterson, Syracuse, N.Y., and Michael J. Skrypa, Florham Park, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
Filed July 18, 1968, Ser. No. 745,675
Int. Cl. A23l *1/26*
U.S. Cl. 99—141 A **13 Claims**

Use of a glucoside-sweetener mixture as a functional sugar substitute, particularly in the preparation of low-calorie food compositions, comprising a food material and a non-nutritive glucoside-sweetener mixture.

3,656,974
POWER DRIVEN STIRRER
Richard F. Mihalyi, 1412 N. Havenhurst Drive, Hollywood, Calif., and Yale R. Wexler, 9779 Oak Pass Road, Beverly Hills, Calif.
Filed Nov. 28, 1969, Ser. No. 880,593
Int. Cl. A47j *43/07*; B01f *7/18*
U.S. Cl. 99—348 5 Claims



The device is a power driven stirrer particularly for food products in a vessel having a source of heat under it. The device provides an impeller or mixer which is rotated relatively slowly by a motor that is battery driven to avoid cords and any possibility of shocks resulting from shorts. The motor and the impeller are suspended in the manner of a pendulum over the vessel with adjustments provided to vary the height of suspension and the position of suspension so that the impeller can be centered in the vessel. The motor and impeller are supported from a bracket support attachable to the periphery of the vessel in which mixing is to take place.

3,656,975
COATING COMPOSITION
Fred L. Phelps, Jr., North Wales, and James M. Klotz, Quakertown, both of Pa., assignors to Teleflex Incorporated, North Wales, Pa.
Filed Feb. 16, 1970, Ser. No. 11,884
Int. Cl. C09d *5/10*
U.S. Cl. 106—1 2 Claims

The coating composition of this invention consists essentially of a dispersion of aluminum powder and zinc oxide in an aqueous solution of soluble alkali metal silicate containing dissolved chromate. The relative proportions of the ingredients in the preferred compositions are in the range of from about 100 to 500 grams aluminum powder and 30 to 100 grams zinc oxide per liter aqueous solution containing from about 200 to 1200 grams alkali metal silicate and from about 1 to 5 grams chromate. After application the coating compositions of this invention are cured to water insolubility by heat. The compositions are ideally suited for coating metals, particularly ferrous base metal, and provide excellent corrosion and abrasion resistance.

3,656,976
STABLE FLUOROPHOSPHATE OPTICAL GLASS
Tetsuro Izumitani, Tokyo, and Seiichi Toda, Hanno, both of Japan, assignors to Haya Glass Works, Limited, Tokyo, Japan
Filed May 15, 1970, Ser. No. 37,763
Claims priority, application Japan, May 24, 1969, 44/40455
Int. Cl. C03c *3/00*
U.S. Cl. 106—47 Q 4 Claims

Fluoro-phosphate optical glass having an extremely low tendency to devitrify, a high water-durability and a low brittleness is produced by incorporation boron oxide in the binary system phosphoric anhydride-metal fluorides, wherein said metal fluorides consists of alkaline earth metal fluorides such as MgF_2, BaF_2 and CaF_2, and aluminum fluoride with or without alkali metal fluoride or fluorides.

3,656,977
REFRACTORY COMPOSITION
Alfred P. Dreyling, and Lewis J. Dreyling, both of East Brunswick, N.J., assignors to Quigley Company, Inc.
Continuation-in-part of application Ser. No. 751,506, Aug. 9, 1968, now abandoned, which is a continuation-in-part of application Ser. No. 391,182, Aug. 21, 1964, now abandoned. This application Oct. 1, 1969, Ser. No. 862,817
Int. Cl. C04b *35/04*, *35/42*
U.S. Cl. 106—55 2 Claims

A refractory material is premixed with a binder consisting essentially of a mixture of sodium silicate and ammonium pentaborate, to give a refractory composition having a relatively short setting time when mixed with a given amount of water which setting time is predetermined by selecting a weight ratio for the silicate and the pentaborate within a given range.

3,656,978
FIRECLAY REFRACTORY ARTICLES
Berhl E. Wishon, Bethel Park, and Donald P. Crosby, Pittsburgh, both of Pa., assignors to Dresser Industries, Inc., Dallas, Tex.
Original application June 4, 1968, Ser. No. 734,268, now Patent No. 3,527,450. Divided and this application Apr. 6, 1970, Ser. No. 31,069
Int. Cl. C04b *33/00*
U.S. Cl. 106—67 2 Claims

Fireclay refractory shapes bonded with alumina trihydrate and phosphoric acid.

3,656,979
WATER-REPELLENT CEMENT AND SOILS
Wilhelm K. Striebel, Ginsheim, and Werner Loch, Neubeckum/Westphalia, both of Germany, assignors to Dyckerhoff Zementwerke Aktiengesellschaft, Wiesbaden-Amoneburg, Germany
Filed Jan. 6, 1969, Ser. No. 789,372
Claims priority, application Germany, Jan. 8, 1968, P 16 46 502.4
Int. Cl. C04b *13/24*
U.S. Cl. 106—95 6 Claims

A hydrophobic cement especially suited for soil stabilization which comprises a certain amount of a mixture of tertiary, saturated, aliphatic monocarboxylic acids of certain carbon atom content. The improved stabilized soils comprising the cement.

3,656,980
4-TERTIARY-CATECHOL-AQUEOUS SOLUTION COMPOSITION
Tetsuya Harada, Chiba; Nobuo Fuzinami, Ichihara; Koichi Hasegawa, Chiba, and Akira Shibatani, Ichihara, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan
Filed Aug. 10, 1970, Ser. No. 62,609
Claims priority, application Japan, Aug. 12, 1969, 44/63305
Int. Cl. C08h *17/28*
U.S. Cl. 106—285 3 Claims

A homogeneous 4-tertiary-butyl-catechol aqueous solution composition comprising 4-tertiary-butyl-catechol, water and a saturated hydrocarbon having five or more carbon atoms.

3,656,981
PRODUCTION OF FINELY DIVIDED ORGANICALLY MODIFIED SILICAS

Helmut Beschke, Frankfurt/Main; Hans Pfleger, Neu Isenburg; Horst Ferch, Bruchkobel, and Edith Eisenmenger, Offenbach/Main, all of Germany, assignors to Deutsche Gold-Und Silber-Schneideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 646,452, June 16, 1967. This application Apr. 24, 1970, Ser. No. 31,737
Claims priority, application Germany, June 18, 1966, D 50343
Int. Cl. C09c *3/00*
U.S. Cl. 106—288 B 6 Claims

A finely divided organically modified silica is formed by adding an inorganic acid at an elevated temperature to an aqueous alkali methyl silicate solution in contact with a water-soluble reactive organic polymer which is present in an amount of from about 3 to about 24 percent by weight relative to the weight of the thus precipitated silica.

3,656,982
PEARLESCENT PIGMENT

Douglas W. Chapman, Normandy; Wilbur H. McKellin, Creve Coeur, and R. Dean Overley, St. Louis, all of Mo., assignors to Mallinckrodt Chemical Works, St. Louis, Mo.

Filed May 4, 1970, Ser. No. 34,585
Int. Cl. C09c *3/02*
U.S. Cl. 106—291 8 Claims

The luster, compressibility and other cosmetically important properties of various pearlescent pigments are substantially improved by coating the surface of the pigment particles with a composition comprising a precipitated water-insoluble metal stearate and a surfactant.

3,656,983
SHELL MOLD COMPOSITION

Harry V. Sulinski, Philadelphia, Pa., assignor to The United States of America as represented by the Secretary of the Army

Continuation-in-part of application Ser. No. 8,697, Feb. 4, 1970, now abandoned , which is a continuation-in-part of application Ser. No. 780,605, Dec. 2, 1968, now abandoned. This application Oct. 14, 1970, Ser. No. 80,793
Int. Cl. B28b *7/34*
U.S. Cl. 106—38.3 10 Claims

Composition for making shell molds for precision casting of metals containing silica, aqueous collodial silica and graphite in sufficient amounts to control certain properties of the finished mold.

3,656,984
GLASS-CERAMIC PRECURSORS

Lewis Charles Hoffman, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 717,412, Mar. 29, 1968, now Patent No. 3,586,522, which is a continuation-in-part of application Ser. No. 646,414, June 1, 1967, now abandoned. This application Dec. 18, 1970, Ser. No. 99,510
Int. Cl. C03c *3/04, 3/10, 5/02*
U.S. Cl. 106—53 3 Claims

Novel glass-ceramics are prepared from glasses which consist essentially of critical proportionate amounts of SiO_2, PbO, Al_2O_3, TiO_2 and BaO; optional components thereof include ZnO, PbF_2, SrO, ZrO_2, Ta_2O_5, WO_3, CdO, SnO_2 and Sb_2O_3. The glasses are used, e.g., in particulate form, in preparing screen-printable crossover dielectric compositions, and as the inorganic binder component in preparing screen-printable conductor or resistor compositions, each of which may be fired to produce these novel glass-ceramics.

3,656,985
PORTLAND CEMENT COMPOSITION HAVING AN ACCELERATED SET

Bernard Bonnel, St. Cloud, and Christian Hovasse, Decines, both of France, assignors to Progil, Paris, France

Filed Dec. 1, 1970, Ser. No. 94,157
Claims priority, application France, Dec. 2, 1969, 6941443
Int. Cl. C04b *13/24*
U.S. Cl. 106—90 4 Claims

A composition for quickening the setting of Portland cement constituted by 0.5 – 5 parts of alkali aluminate and 0.05 – 2 parts of hydroxylated organic acid.

3,656,986
CHROME PIGMENTS

Charles Harold Buckley, and John Mitchell, both of Manchester, England, assignors to Imperial Chemical Inudstries Limited

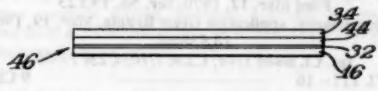
Filed May 11, 1970, Ser. No. 36,473
Claims priority, application Great Britain, May 12, 1969, 24,086/69
Int. Cl. C09c *1/20;* C08h *17/04*
U.S. Cl. 106—302 8 Claims

Chrome pigments of improved durability, especially to atmospheric sulphurous acid, are obtained by adding to a stirred aqueous suspension of a chrome pigment at an initial pH between 1.8 and 8.0 a source of silicate ions, a source of trivalent antimony ions, and an organic hydroxy acid, and adjusting the pH to between 5 and 10.5 by addition of a water-soluble basic compound.

3,656,987
ARTICLE FOR REINFORCING CLOTH

George W. Stewart, Waco, Tex., assignor to A. B. Ellis, a part interest

Continuation-in-part of application Ser. No. 638,070, May 12, 1967, now abandoned. This application Jan. 30, 1970, Ser. No. 7,056
Int. Cl. B41m *3/12*
U.S. Cl. 117—3.4 2 Claims



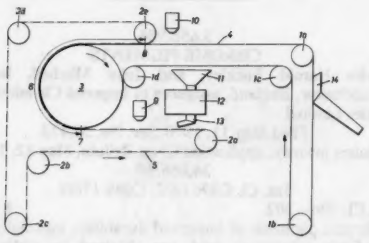
An article and method useful for providing a flexible, substantially transparent reinforcing layer for cloth material. The article has a flexible paper base, an intermediate release layer, a layer of thermosetting material coated on said release layer and an outer layer of vinyl material on the thermosetting layer. Upon application of heat to the uncoated side of the paper, the thermosetting and vinyl layers are released from the release layer and transferred as a reinforcing patch to cloth material. The process for making this article comprises applying a layer of thermosetting material to a silicone coated paper product, drying the thermosetting layer and coating the thermosetting layer with a vinyl material, and then partially curing the vinyl so that it may be later reactivated for transfer to the cloth material.

3,656,988

METHOD FOR THE FABRICATION OF HOLES IN A WORKPIECE BY MEANS OF LASER-BEAMS AND APPARATUS FOR THE PERFORMANCE OF THE AFORESAID METHOD

Jurg Steffen, Zurich, and Arnold Hofer, Muttenz, both of Switzerland, assignors to Watch Stones Co., Ltd., Berne and Turlabor AG, Zumikon, Switzerland

Filed Feb. 19, 1970, Ser. No. 12,691
Claims priority, application Switzerland, Feb. 27, 1969, 2951/69; 2956/69
Int. Cl. B44d 1/52, 1/02
U.S. Cl. 117—5.5 8 Claims



A method for producing holes in a workpiece by means of a laser beam which comprises the steps of coating at least one face of the workpiece with an organic agent prior to contact of the laser beam with the workpiece in order to thereby prevent a fusion of the workpiece material ejected in liquid state with an outer face of such workpiece during the boring process.

There is also disclosed an apparatus used in the performance of this method and for coating both sides of disc-shaped workpieces which incorporates two band members guided above one another at a spacing along a predetermined path. This spacing of the band members is smaller than the height of the workpieces. One of the band members has a smooth surface and the other an adhesive surface, and two coating locations are arranged such that one is before and the other behind the aforementioned predetermined path.

3,656,989

PRODUCTION OF METAL-IMPREGNATED POROUS COKE MATERIALS

Kenneth Frederick Layland, Nechells, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed Mar. 12, 1970, Ser. No. 19,123
Claims priority, application Great Britain, Mar. 19, 1969, 14,538/69
Int. Cl. B44d 1/44; C23c 1/10; C23f 17/00
U.S. Cl. 117—16 9 Claims

Metal impregnated porous materials, e.g. magnesium impregnated coke, are produced by immersing pieces of porous material in molten metal and then dumping them into a fluidized bed of granular material to quench them.

3,656,990

ELECTROSOLOGRAPHY

William L. Goffe, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Continuation-in-part of application Ser. No. 403,002, Oct. 12, 1964, now abandoned , and a continuation-in-part of 460,377, June 1, 1965, now Patent No. 3,520,681, which is a continuation-in-part of application Ser. No. 403,002,. This application Aug. 30, 1965, Ser. No. 483,675
Int. Cl. G03g 13/00
U.S. Cl. 117—17.5 8 Claims

An imaging member comprising a fracturable layer contacting a solvent soluble layer overlying a substrate, said fracturable layer spaced apart from said substrate is imaged by forming an electrostatic image on said member and then contacting said member with a solvent for said solvent soluble layer to form an imagewise pattern of material from said fracturable layer on said substrate.

3,656,991

PROCESS OF TREATING WATER SWELLABLE CELLULOSIC MATERIALS

John Blackwell, Kennett Square, Pa.; William Henry Gumprecht, Wilmington, Del., and Roy Emerson Starn, Jr., West Chester, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 25, 1968, Ser. No. 778,761
Int. Cl. C09k 3/28; D06m 7/00
U.S. Cl. 117—33.3 25 Claims

A process for treating water swellable cellulosic materials, or mixtures or blends thereof with synthetic materials, with preformed agents selected from flame retarding agents, biocides, ultraviolet light absorbing agents, fluorescent brighteners and water proofing agents to provide treated materials which are fast to aqueous washing and drycleaning, said process comprising contacting said cellulosic material in any sequence with water in an amount sufficient to swell the cellulose, at least an effective amount of a preformed treating agent of low water solubility and of the aforesaid type, and a solvent for said treating agent, said solvent being an ethylene glycol or a polyethylene glycol, e.g., diethylene glycol monomethyl ether; being at least partially miscible with water; having a boiling point above about 150° C. at atmospheric pressure; and being present in an amount sufficient to maintain swelling of the cellulose if the water is removed, provided that at some stage during the process the interior of the swollen cellulose is contacted with a solution of the treating agent in aqueous solvent or solvent.

3,656,992

METHOD OF COATING CELLULAR CORE STRUCTURES

Peter Henry Lynam, Linto, and Keith Noakes, Cambridge, both of England, assignors to CIBA (A.R.L.) Limited, Duxford, Cambridge, England

Filed Feb. 17, 1970, Ser. No. 12,148
Claims priority, application Great Britain, Feb. 28, 1969, 11,006/69
Int. Cl. B32b 3/12, 31/00
U.S. Cl. 117—43 16 Claims

A method of providing cellular core structures with fillets of adhesive, to core structures so provided with fillets, and to assemblies of such core structures and facing panels. The core structures are used in the aircraft and other industries as bonds to high strength facing panels.

3,656,993

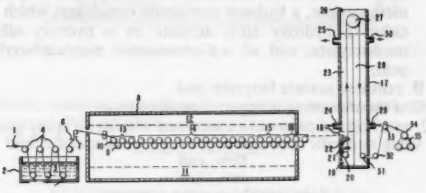
PREPARATION OF COATED REGENERATED CELLULOSE FILM

Bernard S. Edwards, and Vernon C. Haskell, both of Richmond, Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed June 4, 1970, Ser. No. 43,511
Int. Cl. B44d 1/092
U.S. Cl. 117—56 6 Claims

A process for preparing coated regenerated cellulose film which comprises successively softening the regenerated cellulose gel-state web with polyethylene glycol, drying the web

with controlled shrinkage, coating the web and humidifying the web while permitting at least about ½ percent longitudinal shrinkage. The resulting coated product exhibits improved permanent shrinkage properties.



3,656,994

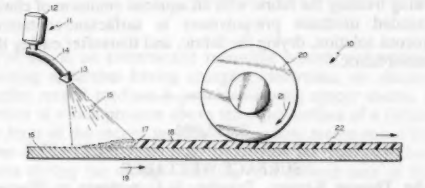
OXYBENZOYL POLYESTER COATINGS

James Economy, Buffalo; Steve G. Cottis, Buffalo, and Bernard E. Nowak, Lancaster, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed May 28, 1969, Ser. No. 828,693

Int. Cl. B32b *15/08;* **B44d** *1/44, 1/097*

U.S. Cl. 117—62 **11 Claims**



A process for reducing the porosity of an oxybenzoyl polyester film by subjecting the surface of the film to a shearing action.

3,656,995

CHEMICAL VAPOR DEPOSITION COATINGS ON TITANIUM

Carl D. Reedy, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 2, 1969, Ser. No. 821,506

Int. Cl. C23c *11/00, 13/00;* **C21d** *1/56*

U.S. Cl. 117—69 **37 Claims**

A process for coating titanium-containing substrates with a dense, adherent, chemically vapor deposited coating by initially effecting a protective, adhesion-promoting, intermediate layer on the titanium surface and subsequently depositing from the vapor phase a metal nitride, carbide, or carbonitride coating on the intermediate film. For example, a titanium article may be initially nitrided to provide a titanium carbonitride protective layer and titanium nitride, titanium carbide, or titanium carbonitride may subsequently be deposited from the vapor phase onto this film to provide a dense, adherent, protective coating on the titanium article. The barrier layer serves to promote adhesion between the titanium substrate and the final overlay and to prevent reaction between the substrate and such a reaction ingredient as titanium tetrachloride, which is preferred constituent for supplying titanium in the titanium carbide, nitride, or carbonitride final coating.

3,656,996

ANTISTATIC POLYESTER FILM

August Jean Van Paesschen, Antwerp, and Lucien Janbaptist Van Gossum, Kontich, both of Belgium, assignors to Gevaert-AGFA N.V., Mortsel, Belgium

Filed Apr. 10, 1970, Ser. No. 27,452

Claims priority, application Great Britain, Apr. 11, 1969, 18,682/69

Int. Cl. B32b *27/06;* **C09k** *3/16*

U.S. Cl. 117—68 **6 Claims**

The tendency of polyester films to attract dust and develop scratches is reduced by applying to each side of such films a coating having a perceptible thickness of at most 0.1 μ and essentially consisting of 70 to 90 percent by weight of a waxy material having a melting point about 75° C and 30 to 10 percent by weight of an antistatic compound.

3,656,997

COATED GELATIN CAPSULES AND PROCESS FOR PRODUCING SAME

Gunter Cordes, Monheim, Germany, assignor to Sanol-Arzneimittel Dr. Schwarz GmbH, Monheim, Germany

Filed May 11, 1970, Ser. No. 36,458

Claims priority, application Germany, May 14, 1969, P 14 24 647.0

Int. Cl. A61k *9/04;* **B44d** *1/14*

U.S. Cl. 117—73 **4 Claims**

Gelatin capsules filled with an active ingredient or ingredients are protected against solution in the stomach in order that they may reach the intestines and be absorbed therein by providing said capsules with a primary lacquer containing a soluble film-forming colloidal material soluble both in water and in organic solvents and then with a lacquer unaffected by gastric juices and soluble in intestinal juices.

3,656,998

PACKAGING FOIL AND PROCESS FOR PRODUCING SAME

Gerhard Ottmann, and Clemens Lilienbeck, both of Wuppertal-Barmen, Germany, assignors to Dr. Kurt Herberts & Co., Vorm. Otto Louis Herberts, Berman, Germany

Filed Feb. 25, 1970, Ser. No. 14,237

Claims priority, application Sweden, Feb. 26, 1969, 2607/69

Int. Cl. B32b *27/08;* **B44d** *1/14*

U.S. Cl. 117—75 **18 Claims**

Packaging foil comprising a flexible support foil, a top layer of a vinyl polymer, and an adhesion promoter or primer between the support foil and top layer, wherein the primer is a mixture of a chlorine or fluorine containing polymer, an organic compound of at least two isocyanate groups, and a reaction product having terminal hydroxyl groups and derived from a linear polyester with terminal hydroxyl groups and an organic diisocyanate.

3,656,999

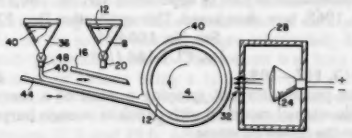
COATED ROLLER AND METHOD OF COATING

Christian B. Lundsager, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,141

Int. Cl. B44d *1/50*

U.S. Cl. 117—93.31 **17 Claims**



Industrial rollers are prepared by photocuring a coating of photocurable composition on a metallic core. As the core

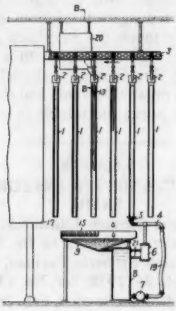
cylinder is rotated, a thin layer of photocurable composition containing an epoxy polyene is fed intermittently or continuously onto the rotating cylinder, where it can optionally be smoothed by a doctor blade. That layer is applied as an adhesive layer. Then at least one complete layer of another photocurable composition is fed onto the coated rotating cylinder. The coating is photocured by an ultraviolet light source, which is preferably located on the cylinder side opposite the places where the photocurable compositions are applied, so that premature hardening does not occur in the feed stock. Multiple, consecutive layers of the second photocurable composition can be built up on the coated core, each (after the first) being placed upon a partially hardened photocured sublayer. In this manner, the photocured material on the rigid core can be built up to any desired and practical thickness. The photocured surface of the roller can be ground and buffed to make a final product of accurately controlled dimensions.

3,657,000

METHOD FOR PAINTING INNER SURFACE OF PIPE

Kimiaki Kasano, Amagasaki-shi, Hyogo-ken, and Ichiro Kaya, Sakai-shi, Osaka-fu, both of Japan, assignors to Kansai Paint Company Limited, Hyogo-ken, Japan

Filed June 23, 1969, Ser. No. 835,705
Claims priority, application Japan, July 2, 1968, 43/46399
Int. Cl. B44d *1/09, 1/02*
U.S. Cl. 117—97 **3 Claims**



A method and apparatus for interior painting of pipe, particularly of small diameter, is characterized by filling of a pipe with both ends open with paint, hanging the pipe vertical and passing a ball of a diameter smaller than the inside diameter of the pipe from the upper end of the pipe to fall down by its gravity through the pipe and strip off excessive paint so as to form a film of uniform thickness of paint of the inner surface of the pipe.

3,657,001

PROCESS FOR HOT SPRAYING A THERMOSETTING ACRYLIC ENAMEL MODIFIED WITH CELLULOSE ACETATE BUTYRATE

Fred W. Parker, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 780,190, Nov. 29, 1968, now abandoned. This application Dec. 22, 1970, Ser. No. 100,831
Int. Cl. B44d *1/08*
U.S. Cl. 117—105.1 **11 Claims**

The process for hot spraying a paint of a thermosetting acrylic enamel modified with cellulose acetate butyrate comprises the following steps:

1. heating the paint having a high solids content of film-forming materials to about 50°–100° C. to reduce the viscosity of the paint;

wherein the film-forming materials of the paint consist essentially of:

A. an acrylic polymer containing styrene, methyl methacrylate, a soft constituent, such as an alkyl acrylate or an alkyl methacrylate other than methyl methacrylate, a hydroxy containing constituent which is either a hydroxy alkyl acrylate or a hydroxy alkyl methacrylate, and an α,β-unsaturated monocarboxylic acid;

B. cellulose acetate butyrate; and

C. a thermosetting nitrogen containing resin;

2. spraying the paint onto a substrate with an air spray gun using a specific atomization pressure and a specific fluid flow; and

3. baking the coating substrate.

The novel process is particularly useful for applying a finish at a high solids content to automobiles and trucks in the manufacturing plant and in repair garages and has the advantage of using substantially less solvent than conventional finishes and thereby reduces air pollution.

3,657,002

SHRINKPROOFING WOOL FABRICS

John D. Blodger, and Ian MacGugan, both of Detroit, Mich., assignors to Wyandotte Chemicals Corporation, Wyandotte, Mich.

Filed Aug. 5, 1969, Ser. No. 851,772
Int. Cl. D06c *29/00;* **D06m** *15/52*
U.S. Cl. 117—141 **11 Claims**

A method for rendering wool fabric shrink resistant comprising treating the fabric with an aqueous emulsion of chain-extended urethane pre-polymers in surfactant-containing aqueous solution, drying the fabric, and thereafter curing the treated fabric.

3,657,003

METHOD OF RENDERING A NON-WETTABLE SURFACE WETTABLE

John Thomas Kenney, Trenton, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 8,022
Int. Cl. B44d *1/02*
U.S. Cl. 117—120 **21 Claims**

Aqueous wetting solutions comprise stable colloids, the solid phase of which is a hydrous oxide of one or more selected elements. The solid, particulate phase of the colloid is produced by a controlled hydrolysis and nucleation reaction which continues until solid phase particles having appropriate size and surface chemistry result. Application of the wetting solutions to any known non-wettable surface renders such surface wettable, via deposition of the particles of the solid phase onto the surfaces by short order forces. The rendering of the surfaces wettable is accomplished without effecting a physical or chemical change of the surface.

3,657,004

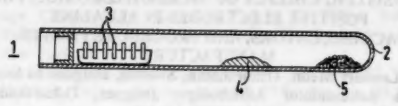
METHOD FOR PRODUCING HIGHLY PURE GALLIUM ARSENIDE

Hans Merkel, Erlangen, and Siegfried Leibenzeder, Erlangen-Buchenbach, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Jan. 8, 1970, Ser. No. 1,399
Claims priority, application Germany, Jan. 11, 1969, P 19 01 319.5
Int. Cl. C23c *11/00, 13/00;* **H01l** *7/36*
U.S. Cl. 117—201 **5 Claims**

Method of depositing gallium arsenide upon substrate wafers in a closed reaction system using water as the trans-

port medium. The water together with B_2O_3 is placed in a



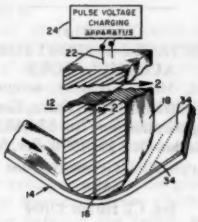
reaction vessel along with gallium arsenide and the wafers to be coated. The ratio of boron oxide to water is $1:10^{-5}$.

3,657,005

ELECTROGRAPHIC RECORD MEDIUM

Arling Dix Brown, Jr., Cleveland Heights, and John Blumenthal, Wickliffe, both of Ohio, assignors to Clevite Corporation

Filed Dec. 29, 1967, Ser. No. 694,654
Int. Cl. H01f *11/02, 10/06*
U.S. Cl. 117—201 7 Claims



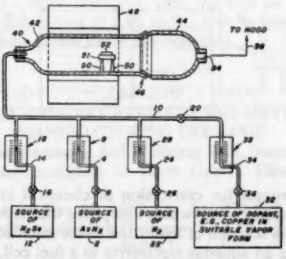
For use in an electrostatic recording system with voltage charging apparatus having charging electrodes, an electrographic record medium is provided having spacer means, a portion of which projects above the outer surface of a dielectric layer of the record medium. The spacer means space the outer surface of the dielectric layer from the charging electrodes during the voltage charging of a defined area of the outer surface of the dielectric layer.

3,657,006

METHOD AND APPARATUS FOR DEPOSITING DOPED AND UNDOPED GLASSY CHALCOGENIDE FILMS AT SUBSTANTIALLY ATMOSPHERIC PRESSURE

Peter D. Fisher, 3325 St. Paul Street, Baltimore, Md.; James C. Word, IV, 8325 E. Columbus Ave., Scottsdale, Ariz. 85251, and Haden J. Bourg, Jr., 199 Plymouth Lane, Apt. B, both of Glen Burnie, Md.

Filed Nov. 6, 1969, Ser. No. 874,646
Int. Cl. C23c *13/04*
U.S. Cl. 117—201 7 Claims



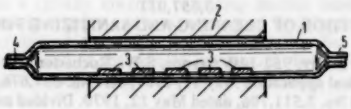
Glassy chalcogenide films like copper-doped arsenic selenide, useful in vidicons and amorphous, current-controlled switches and hitherto obtainable only through time-consuming vacuum-deposition techniques, are obtained by heating and reacting in an open tube a first compound (arsine, stibine, phosphine, or the like) with a second compound (hydrogen selenide, hydrogen sulfide, or the like). Hydrogen gas is preferably used as a flush gas, and the dopant is preferably supplied in vapor form so that the amount thereof in the film can be readily controlled.

3,657,007

METHOD FOR PRODUCING AN INSULATING LAYER ON THE SURFACE OF A SEMICONDUCTOR CRYSTAL

Erich Pammer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Nov. 28, 1969, Ser. No. 880,561
Claims priority, application Germany, Dec. 3, 1968, P 18 12 455.5
Int. Cl. H01l *7/28;* H01b *3/10*
U.S. Cl. 117—201 3 Claims



Method of producing an insulating layer on the surface of a semiconductor crystal. The protective layer comprising a metal oxide, is precipitated through oxidation of a gaseous, halogen free organic compound of the metal Me, upon which the oxide is based, with at least one Me-C bond. The precipitation is effected at the surface of the heated semiconductor crystal whereby the rest of the components of the organic compound remain in the gaseous phase.

3,657,008

POLYESTER WIRE INSULATION

Clyde E. Gleim, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 2, 1970, Ser. No. 8,015
Int. Cl. B44d *1/16, 1/18, 1/42*
U.S. Cl. 117—218 5 Claims

The invention relates to insulation coatings for wire consisting of an outer jacket coating of highly crystallizable polyester resin and an undercoat of softer less crystallizable polyester resin.

3,657,009

PROCESS FOR ALUMINIZING THE SCREEN OF A CATHODE RAY TUBE

Robert A. Hedler, and Malcolm E. Magill, both of Seneca Falls, N.Y., assignors to Sylvania Electric Products Inc.

Continuation-in-part of application Ser. No. 422,558, Nov. 31, 1964, now abandoned. This application Apr. 12, 1968, Ser. No. 721,077
Int. Cl. H01j *31/20*
U.S. Cl. 117—33.5 CM 3 Claims

An improved process for aluminizing the screen of a cathode ray tube wherein rapid and uniform dampening of the applied phosphor screen is accomplished prior to lacquering by rinsing with an aqueous solution of an organic solvent wherein the solvent content ranges substantially from one to twenty percent by volume. The solvent is at least one selected alcohol or ketone being a 1, 2, 3, 4 or 5 carbon chain compound having one functional radical group with a melting point below −11° centigrade and a molecular weight ranging between 32.0 and 89.0. After rinsing, a lacquer film is applied over the screen upon which a thin aluminum film is disposed. Subsequent baking removes the lacquer material from the screen.

3,657,010

HEATING CORN SYRUP SOLIDS WITH ACIDS TO PRODUCE A DRY POWDER

William A. Mitchell, Lincoln Park, N.J., and William C. Seidel, Monsey, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,955
Int. Cl. C13k *1/00*
U.S. Cl. 127—70 7 Claims

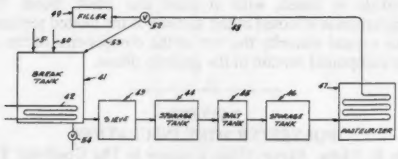
Hydrolyzed starch materials such as corn syrups are heated in the presence of acid to a temperature of about 300° F. to 370° F. The resultant product is allowed to cool and solidify; it may then be ground to a dry powder. The powder so produced can be stored in paper envelopes under rather severe temperature humidity conditions and will remain dry and will not clump.

3,657,011

METHOD OF CLEANING AND SANITIZING FOOD PROCESSING DEVICES

Donald J. Orr, 952-14th Avenue, S.W., Rochester, Mich.

Original application May 11, 1967, Ser. No. 637,676, now Patent No. 3,511,706, dated May 12, 1970. Divided and this application Jan. 27, 1970, Ser. No. 10,106
Int. Cl. B08b *3/10, 9/08, 7/02*
U.S. Cl. 134—17 5 Claims



A cleaning method for a series of food processing devices consisting of preparing a cleaning solution of proper concentration and temperature at a central location and passing the solution through the series of devices one after another and then passing a sanitizing solution through the devices. The method further includes utilizing thermo-shock treatment to remove baked or burned on contaminations from the devices.

3,657,012

PROCESS FOR DECONTAMINATING RADIOACTIVE OBJECTS

Jean-Louis Verot, Saint-Cyr L'Ecole, and Rene Sarfati, Paris, both of France, assignors to Ugine Kuhlmann, Paris, France

Filed Aug. 14, 1968, Ser. No. 752,504
Claims priority, application France, Aug. 17, 1967, 118019
Int. Cl. B08b *3/00*
U.S. Cl. 134—26 11 Claims

A process for decontaminating radioactive objects by washing them in a solution of α-amino (alkane-phosphonic) acid and a tensio-active substance that has been neutralized to a pH from 7 to 7.5 and diluted to a 10 percent concentration. The wash effluents are decontaminated by adding to the effluents sufficient calcium-ions to displace the rare earths and strontium from their complexes with α-amino (alkane-phosphonic) acid and thereafter scrubbing.

3,657,013

ELECTROCHEMICALLY ACTIVE MATERIAL, CONSISTING CHIEFLY OF NICKEL HYDROXIDE, FOR POSITIVE ELECTRODES IN ALKALINE ACCUMULATORS, AND PROCEDURE FOR ITS MANUFACTURE

Ake Lennart Melin, Oskarshamn, Sweden, assignor to Svenska Ackumulator Aktiebolaget Jungner, Oskarshamn, Sweden

Filed Feb. 26, 1970, Ser. No. 14,548
Claims priority, application Sweden, Mar. 11, 1969, 3353/69
Int. Cl. H01m *43/04*
U.S. Cl. 136—28 7 Claims

Electrochemically active material consisting essentially of nickel hydroxide for use as a positive electrode in alkaline accumulators, the electrochemically active material containing from 0.05 to 5.0 percent by weight, based on the weight of the nickel hydroxide, of a sulfate of at least one metal selected from the group consisting of barium, strontium, mercury and antimony, the electrochemically active material being substantially free of residual alkali metal sulfate, and a process for producing the same are disclosed.

3,657,014

POROUS ELECTRODE-SUPPORT FOR ALKALINE ACCUMULATORS

Peter Faber, Kahl, Main, Germany, assignor to Rheinisch-Westfalisches-Elektrizitatswerk, Essen, Germany

Continuation of application Ser. No. 834,683, June 19, 1969. This application Oct. 19, 1970, Ser. No. 82,089
Claims priority, application Germany, June 20, 1968, P 17 71-646.0
Int. Cl. H01m *35/04*
U.S. Cl. 136—64 4 Claims

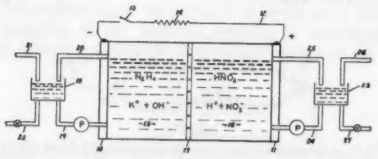
A porous electrode support for alkaline accumulators consisting of a sintered mass of chemically nickel-coated graphite particles with a particle size of 5 to 200 μ. A reinforcing fiber layer is sintered to the particles and can consist of synthetic resin or vitreous fibers coated with nickel. Preferably the fiber reinforcing mats or webs are provided on both faces of the flat support.

3,657,015

HYDRAZINE FUEL CELL AND PROCESS OF OPERATING SAID FUEL CELL

Franklin Veatch, Lyndhurst; Ernest C. Milberger, Maple Heights, and Robert D. Presson, Cleveland, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed May 2, 1960, Ser. No. 26,185
Int. Cl. H01m *27/26, 27/30*
U.S. Cl. 136—83 R 10 Claims



1. A process for conversion of chemical energy directly into electrical energy which comprises the steps of supplying an aqueous solution of hydrazine to the interface between an anode and an aqueous electrolyte in a fuel cell, supplying an oxidizing agent to the interface between a cathode and an aqueous electrolyte in said fuel cell said anode and cathode being ionically connected, and electrically connecting said anode and cathode through an electrical load.

3,657,016

SOLID STATE BATTERY HAVING A RARE EARTH FLUORIDE ELECTROLYTE

Arnys Clifton Lilly, Jr., and Calvin O. Tiller, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of application Ser. No. 878,287, Nov. 20, 1969. This application June 12, 1970, Ser. No. 45,804

Int. Cl. H01m 11/00

U.S. Cl. 136—83 11 Claims

A solid state battery comprising an oxygen-impermeable casing containing an electrochemical cell having a cathode, an anode of a material forming stable fluorides and a rare earth fluoride electrolyte. The battery is formed by thin film deposition of the cell elements and is self-limiting as respects output current under load.

3,657,017

SELF-FEEDING SEA WATER BATTERY

Albert E. Ketler, Jr., 318 North 6th Street, Indiana, Pa.

Filed Oct. 20, 1970, Ser. No. 82,389

Int. Cl. H01m 17/00

U.S. Cl. 136—100 R 17 Claims

A galvanic cell or battery is powered by a centrally disposed anode and an outwardly, edgewise-spaced and disposed group of outwardly disposed cathodes of dissimilar electrolytically reactive metal, and has lever-operated lifting means or spring means for automatically adjusting the relation between the cathodes and the anode as the anode is destructively worn away during power generating utilization of the battery. The adjusting means is adapted to exert lateral, radial or axial pressure on the group of cathodes to urge them against insulating means which defines a desired operative spacing between the anode and the group of cathodes. Wire screen material is folded or wound about and is secured on a centrally positioned metal backing member to provide cathode elements.

3,657,018

ALKALINE GALVANIC CELL HAVING A COVER MADE OF AN ELASTICALLY RESILIENT LAMINATE

Paul Ruetschi, Yverdon, Switzerland, assignor to Leclanche S.A., Yverdon, Vaud, Switzerland

Filed Apr. 21, 1970, Ser. No. 30,411

Claims priority, application Switzerland, May 2, 1969, 6756/69; May 9, 1969, 6756/69

Int. Cl. H01m 21/00

U.S. Cl. 136—111 7 Claims

An alkaline galvanic cell having a positive electrode containing a heavy metal oxide in contact with a metallic housing and a negative electrode containing an amalgamated zinc in contact with a cover, said cover being formed from an elastically resilient laminate having an exterior side consisting of a layer of nickel or a layer of a rust-proof nickel alloy and having a thickness of 0.05 to 0.5 mm. and an interior side consisting of a layer of copper, zinc, tin, lead or their alloys and having a thickness of 0.05 to 0.5 mm. at least one layer of said laminate consisting of a spring alloy.

3,657,019

ELECTRIC PRIMARY ELEMENT AND METHOD OF MANUFACTURING THE SAME

Fritz Alf, Bad Homburg, and Wolfgang Brill, Dusseldorf, both of Germany, assignors to Varta GmbH, Ellwagen/Jagst, Germany

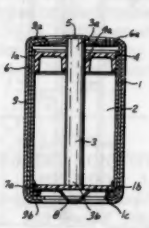
Filed Nov. 18, 1969, Ser. No. 877,629

Claims priority, application Germany, Nov. 19, 1968, P 18 09 600.9

Int. Cl. H01m 1/02

U.S. Cl. 136—133 14 Claims

A tubular member constituting a first electrode contains a depolarizing agent and a second electrode axially extending therethrough. One of the open ends of the tubular member is sealed with a first flexible disc with an end portion of the second electrode projecting outwardly through the disc and provided with an electrically conductive cap which overlies the disc. The other open end of the tubular member constitutes a radially inwardly extending annular bead which fluid-tightly engages and retains a second flexible disc and a contact disc which overlies the second flexible disc and engages the bead of the tubular member. A dielectric and a protective casing surround the tubular member.



3,657,020

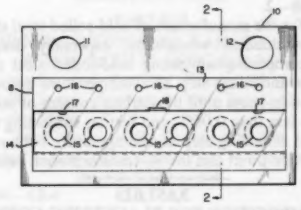
STORAGE BATTERY COVERS

John L. Harrah, 79 West Glendale St., Bedford, Ohio

Filed Apr. 10, 1970, Ser. No. 24,438

Int. Cl. H01m 1/02, 1/06

U.S. Cl. 136—170 2 Claims



A cover for automotive storage batteries and more specifically to a battery cover having an integrally formed transparent panel portion to determine the electrolyte level of the batteries and having a series of open holes to allow filling the battery with electrolyte or water. The open holes each have an integral, downwardly extending tube-like portion opening into and leading to each of the battery cells. The open holes are closed with the application of a detachable air vented closure.

3,657,021

EMERGENCY POWER PACK

John P. Mathews, Port Credit, Ontario, Canada, assignor to Mallory Battery Company of Canada Limited, Clarkson, Ontario, Canada

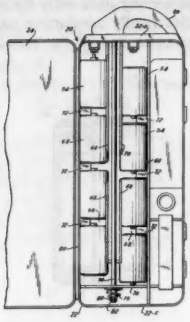
Filed Apr. 20, 1970, Ser. No. 29,848

Int. Cl. H01m 1/04

U.S. Cl. 136—173 8 Claims

An emergency power pack for a gas furnace, with a plurality of reserve type batteries in the power pack, kept normally inactive in a wall-mounted box, and rendered active by a simple manually operable lever on the outside of the box, with a co-operative electronic system for controlling the energy from said battery when rendered active, to supply pulse power initially to operate electrical controls for sole-

noid valves, and to then reduce the power supplied from the battery to the solenoids to be merely enough to hold the electrical controls in operated positions, thereby to reduce the drain on the battery as a power supply.



3,657,022

PROCESS FOR THE MANUFACTURE OF COLD-ROLLED STEEL STRIP WITH SUPERIOR MECHANICAL WORKABILITY, ESPECIALLY DEEP FORMING PROPERTIES

Haruo Kubotera; Kazuhide Nakaoka; Kaoru Watanabe, and Teruhisa Tanaka, all of Kawasakiski, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of application Ser. No. 567,334, July 20, 1966, now abandoned. This application Nov. 12, 1969, Ser. No. 871,559

Claims priority, application Japan, Aug. 10, 1965, 40/48225

Int. Cl. C21d *1/74*

U.S. Cl. 148—2 **1 Claim**

Process for the manufacture of cold-rolled steel sheets with superior mechanical workability, especially deep-forming qualities, comprising subjecting cold-rolled steel strips to a preliminary annealing step at a temperature below the A_1-transformation point until the carbon content of said strips is reduced to less than 0.06%, and further subjecting said strips to a second annealing step at a temperature between the A_1-transformation point and the A_3-transformation point.

3,657,023

COMPOSITION FOR BLACKENING COPPER

John J. Grunwald, 150 Roydon Road, New Haven, Conn., and Edmund E. Horner, 105 Crestview Drive, Watertown, Conn.

Filed May 15, 1970, Ser. No. 48,766

Int. Cl. C23f *7/12*

U.S. Cl. 148—6.15 R **19 Claims**

Novel blackening compositions comprising a peroxydiphosphate compound and an alkali metal hydroxide are utilized to produce on copper surfaces a soft, velvet-black coating which can be mechanically rubbed to form a smooth, black finish. The coating process is carried out by immersing the copper article in the aqueous blackening bath at a temperature of about 150° to about 210° F. for about 3 to about 30 minutes.

3,657,024

STEEL FOR ELECTRICAL APPLICATIONS AND NOVEL ARTICLE

Lester J. Regitz, Penn Township, Westmoreland, Pa., assignor to United States Steel Corporation

Continuation-in-part of application Ser. No. 591,982, Nov. 4, 1966, now abandoned. This application Dec. 5, 1969, Ser. No. 882,729

Int. Cl. C22c *39/02*

U.S. Cl. 148—315 **3 Claims**

A ductile non-oriented electrical sheet containing up to 0.025% carbon, 1.5 to 2.75% silicon, 1.5 to 6% aluminum with the balance iron and normal impurities, and having the combined silicon and aluminum content within the range 3 to 7.5%, and an aluminum content equal to or greater than the silicon content. Upon a controlled atmosphere anneal, a complex oxide of iron, silicon and aluminum is formed on the sheet surface which provides a high degree of electrical resistance across the surface of the sheet.

3,657,025

NICKEL-IRON BASE MAGNETIC MATERIAL WITH HIGH INITIAL PERMEABILITY AT LOW TEMPERATURES

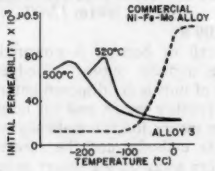
Friedrich Pfeifer, Oberissigheim, Kreis, Hanau, Germany, assignor to Vacuumschmelze GmbH, Hanau, Germany

Filed Mar. 17, 1969, Ser. No. 807,652

Claims priority, application Germany, Apr. 11, 1968, P 17 58 152.1

Int. Cl. H01f *1/14*

U.S. Cl. 148—31.55 **6 Claims**



A nickel-iron base alloy is described to which controlled amounts of copper, manganese and molybdenum may be added. By proper selection of composition and heat treatment high initial permeabilities are obtained at cryogenic temperatures.

3,657,026

HIGH INITIAL PERMEABILITY FE-48NI PRODUCT AND PROCESS FOR MANUFACTURING SAME

David A. Colling, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 28, 1969, Ser. No. 845,134

Int. Cl. H01f *1/16*; C22c *19/00*

U.S. Cl. 148—120 **7 Claims**

A process is described for producing iron-nickel magnetic alloys having a high initial permeability. Various steps including air melting, vacuum remelting with critical control of the carbon oxygen and sulfur levels are employed along with the secondary recrystallized microstructure to achieve the desired results.

3,657,027

INJECTION MOLDABLE FLAMMABLE COMPOSITION AND DEVICES MADE THEREFROM

Eleanor F. Horsey, Chevy Chase, Md.; Joseph W. Warwick, Washington, D.C., and Horst W. Rauhut, Crystal Lake, Ill., assignors to The United States of America as represented by the Secretary of the Army

Filed Apr. 9, 1969, Ser. No. 814,584

Int. Cl. C06c *7/00*

U.S. Cl. 149—19 **9 Claims**

An injection moldable flammable composition consisting of a powder comprising 30–80 percent of red phosphorus and 70–20 percent of a polymeric binder comprising polyethylene, polypropylene, or copolymer thereof. Flammability and stability may be increased by the addition of lesser quantities of polystyrene and ignition aids and anti-oxidants such as aluminum oxide. Flammable strikers and other useful devices may be molded from this composition.

3,657,028

PLASTISOLS AND PROPELLANTS CONTAINING ALKYLENE DIHYDRAZINES

Calvin E. Pannell, Lafayette, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Apr. 11, 1964, Ser. No. 367,606
Int. Cl. C06d 5/06
U.S. Cl. 149—19 6 Claims

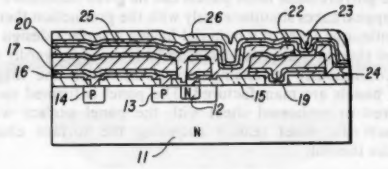
5. In a solid rocket propellant grain comprising a fuel, oxidizer and binder the improvement which comprises a binder consisting essentially of a relatively non-volatile high nitrogen hydrazine substituted plasticizer material and a hydrophilic polymer, said plasticizer material being liquid at the temperature of formulating said composition and said hydrophilic polymer yielding an extensible, elastic material when blended with said plasticizer, the relative proportions of said plasticizer and said polymer ranging from about 15/1 to 1/3 on a weight basis, said binder being from about 10 to about 60 weight percent of the total propellant gain.

3,657,029

PLATINUM THIN-FILM METALLIZATION METHOD

Clyde R. Fuller, Plano, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 31, 1968, Ser. No. 788,187
Int. Cl. C23f 1/02; B44d 1/18; C23b 5/64
U.S. Cl. 156—11 10 Claims



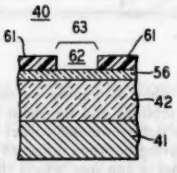
Platinum thin-film metallization is selectively etched with aqua regia, using a chromium or titanium film as an eteh-resistant mask. In a specific embodiment, an integrated circuit structure is metallized with successive layers of titanium, platinum, gold and a metal selected from molybdenum, tungsten, rhenium and corrosion-resistant alloys thereof. The system is particularly suited for the formation of insulated "cross-over" metallization, or multi-level interconnecting metallization.

3,657,030

TECHNIQUE FOR MASKING SILICON NITRIDE DURING PHOSPHORIC ACID ETCHING

Roy Arlie Porter, Whitehall, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 31, 1970, Ser. No. 59,979
Int. Cl. H01l 7/50
U.S. Cl. 156—13 5 Claims



A technique for passivating silicon nitride to phosphoric acid etchants during the formation of semiconductor devices is disclosed. The technique consists of exposing a silicon nitride surface to a diffusion source consisting of either a boron or phosphorous containing source material. The silicon nitride surface is exposed to the diffusion source, at a temperature ranging from 750–1,140° C, for a period of time sufficient to form a diffused source-rich layer of silicon nitride having the desired depth. The source-rich film is then oxidized in a wet oxygen or steam ambient, at a temperature ranging from 850–1,100° C, for a period of time sufficient to form a passivating film. The passivating film is immune from attack by phosphoric acid but can be etched with hydrofluoric acid.

3,657,031

PRODUCTION OF BONDED NONWOVENS BY THE WET METHOD

Hans Reinhard, Limburgerhof; Gerhard Welzel, Mannheim; Hans-Ulrich Frank, and Rudolf Stephan, both of Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed June 27, 1969, Ser. No. 837,313
Claims priority, application Germany, June 29, 1968, P 17 69 699.0
Int. Cl. B29j 5/00
U.S. Cl. 156—62.2 9 Claims

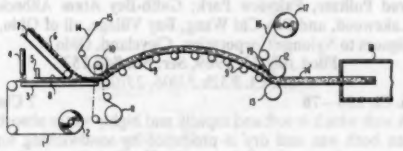
Textile nonwovens can be prepared with particular advantage by treatment of textile fibers suspended in an aqueous medium with dissolved quaternary organic ammonium salts and with water-soluble salts of polymers having carboxyl groups of vinylpyrrolidone polymers, precipitation of binder polymers dispersed in water onto the treated suspended fibers, separation of the aqueous medium from the fibers and drying the bonded fibers.

3,657,032

METHOD FOR CONTINUOUSLY MANUFACTURING REINFORCED PLASTIC BOARD

Shigeo Watanabe, and Tomomi Yamaguchi, both of Fukushima-shi, Japan, assignors to Nitto Boseki Co. Ltd., Fukushima-shi, Japan

Filed Nov. 8, 1968, Ser. No. 774,279
Claims priority, application Japan, Nov. 8, 1967, 42/71442
Int. Cl. B32b 17/04
U.S. Cl. 156—62.4 5 Claims

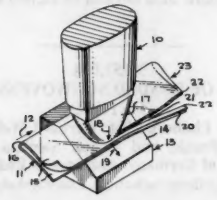


Method for continuously manufacturing reinforced plastic boards and by a liquid resin impregnation step which comprises successively depositing a layer of a heat-hardenable synthetic resin and a layer of fibrous material onto a lower inert film, and maintaining the thus formed composite in intimate contact over an arcuate path by depressing the composite with a plurality of arcuately deposed filamentary members which contact the composite, depositing an upper inert film onto the composite, compressing the upper and the lower film-contained unit, whereby excess resin solution is intimately saturated into the fibrous mat. The filamentary members are removed from the compressed composite by the passage of the reinforced plastic board from the processing area. Apparatus for continuously manufacturing reinforced plastic board is also disclosed in the specification.

3,657,033
METHOD AND APPARATUS FOR CONTINUOUS CUTTING AND JOINING OF THERMOPLASTIC SHEET MATERIAL

Thomas B. Sager, Plymouth Valley, Pa., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.

Filed Mar. 26, 1969, Ser. No. 810,638
Int. Cl. B29c *27/08*
U.S. Cl. 156—73 **5 Claims**



A method and means for continuously cutting and sealing thin gauge thermoplastic sheet material using kinetic energy produced by a horn of reduced sealing area.

3,657,034
METHOD OF PRODUCING SHEET MATERIALS SIMILAR TO LEATHER

Osamu Fukushima; Yoshitami Saito, and Yuya Enomoto, all of Kurashiki, Japan, assignors to Kurashiki Rayan Co., Ltd., Kurashiki, Japan

Filed Sept. 10, 1969, Ser. No. 856,809
Claims priority, application Japan, Sept. 20, 1968, 43/68,655; Oct. 13, 1968, 43/79491; Nov. 15, 1968, 43/83947
Int. Cl. B32b *5/18*
U.S. Cl. 156—77 **7 Claims**

Leather-like sheet materials having good moisture permeability and having appearance, texture, touch, drape and grain break similar to those of leather are produced by applying a layer of a solution of a polymer capable of being coagulated in a wet process onto a support; immersing the polymer solution applied to the support into a coagulation bath to coagulate the polymer solution layer into a porous structure; bonding a substratum to the surface of the resulting porous film which has not been in contact with the support and removing the support from the film.

3,657,035
WATER ABSORBENT WEB AND ITS PRODUCTION

Alfred Politzer, Fairview Park; Galib-Bey Atam Alibeckoff, Lakewood, and Pao-Chi Wang, Bay Village, all of Ohio, assignors to Nylonge Corporation, Cleveland, Ohio

Filed July 23, 1969, Ser. No. 844,153
Int. Cl. B32b *31/06, 23/06*
U.S. Cl. 156—78 **7 Claims**

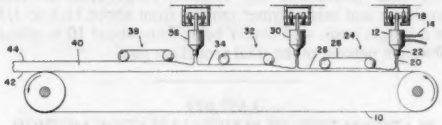
A web which is soft and rapidly and highly water absorbent when both wet and dry is produced by sandwiching under pressure a layer of cellulose pulp fiber reinforced, foamed viscose between thin fleeces of unbonded cotton fibers and regenerating the viscose cellulose. The product is a reticulated matrix of regenerated cellulose and dispersed pulp fibers with the fleece fibers embedded in the opposite faces of the regenerated cellulose layer.

3,657,036
METHOD FOR PRODUCTION OF RIGID POLYURETHANE ARTICLES

James A. Mullenhoff, West Seneca, and Walter E. Voisinet, Colden, both of N.Y., assignors to National Gypsum Company, Buffalo, N.Y.

Filed Oct. 2, 1969, Ser. No. 863,252
Int. Cl. B32b *5/18*
U.S. Cl. 156—79 **8 Claims**

A continuous method for the production of rigid polyurethane foam panels having a density gradient across their thickness is described. The panels are comprised of a plurality of layers intimately bonded together with at least two of the individual layers having densities which are not substantially the same. The variance in the density of the layers is achieved by utilizing non-foamable as well as foamable polyurethane compositions or by varying the formulated foam density of, and/or the degree of restraint exerted against the vertical expansion of successively deposited quantities of foamable polyurethane composition. The panels are made on a continuously advancing means by successively depositing, and forming layers therefrom, a plurality of accurately metered amounts of foamable or non-foamable polyurethane forming compositions. Rigid polyurethane foam



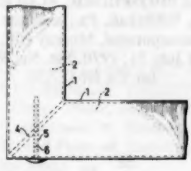
panels comprised of any number of individually formed layers and possessing a variety of density characteristics can be made according to the method.

The polyurethane foam panels can be given decorative surface appearances simultaneously with the production thereof. A continuous sheet of a material having a surface design embodied therein is disposed over, and advanced forwardly with the continuously advancing means on which the integral foam panels are manufactured. The panel is formed on the textured or embossed sheet with the panel surface which contacts the sheet readily acquiring the surface characteristics thereof.

3,657,037
METHOD OF JOINING CORNERS BETWEEN PLASTIC-COVERED WOODEN SECTIONS

Bo Sergius B. Blomquist, Enskede, Sweden, assignor to Hyresgasternas Sparkasse-och Byggnads-foreningars Riksforbud u.p.a., Stockholm, Sweden

Filed June 27, 1969, Ser. No. 837,214
Claims priority, application Sweden, Aug. 15, 1968, 11,026/68
Int. Cl. B29c *11/00*
U.S. Cl. 156—92 **9 Claims**



This invention aims at joining corners between plastic-covered wooden sections and the main object of the invention is to provide tightly welded corner joints of the plastic covering while leaving between adjacent ends of the wooden parts at said corner a gap into which thermosetting resin is injected through at least one hole bored through the welded joint at the outside of the corner so as to glue together the end surfaces of said wooden sections on hardening of the resin.

3,657,038

METHOD OF BONDING EMPLOYING HIGH FREQUENCY ALTERNATING MAGNETIC FIELD

David Reginald Lightfoot, Silver Springs, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed June 26, 1969, Ser. No. 836,803
Claims priority, application Great Britain, July 31, 1968, 36,582/68; 36,583/68; 36,584/68
Int. Cl. B32b *17/00*
U.S. Cl. 156—106 13 Claims

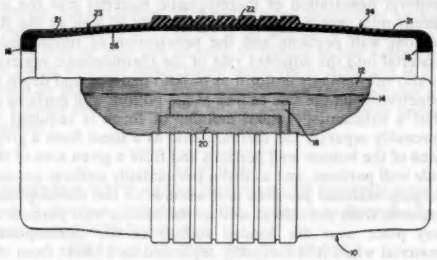
This invention is directed to a method for effecting adhesion between two substrates, at least one of which is glass, which comprises forming an assembly to be bonded by interposing between the substrates and in contact with both, a thermally activatable adhesive composition containing particles of a material which is ferromagnetic or electrically conductive or both, and subjecting the assembly to the action of a high frequency alternating magnetic field until the adhesive has become activated.

3,657,039

METHOD OF MANUFACTURING A PNEUMATIC TIRE

John C. Smithkey, Jr., North Canton, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Original application Oct. 16, 1967, Ser. No. 675,489, now Patent No. 3,540,510. Divided and this application Mar. 9, 1970, Ser. No. 17,680
Int. Cl. B29h *5/02, 17/14*
U.S. Cl. 156—123 5 Claims



A method of manufacturing a pneumatic tire which when inflated has dimensions generally associated with a conventional pneumatic tire but when deflated has an outer diameter and a section width substantially the same, and in any event not substantially greater, than the maximum width and diameter of the rim on which the tire is mounted. The tire is built by the flat band method of construction and is molded at least substantially in the cylindrical shape in which it was built. The sidewalls are sufficiently flexible that they may be folded into an S-shape and underneath the tread when the tire is deflated.

The foregoing abstract is not to be taken as limiting the invention of this application, and in order to understand the full nature and extent of the technical disclosure of this application, reference must be made to the accompanying drawings and the following detailed description.

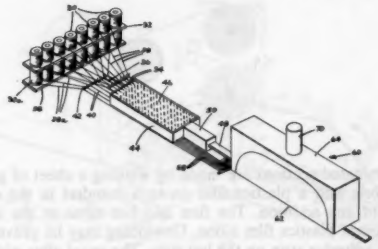
3,657,040

METHOD OF FABRICATING REINFORCED PLASTIC BOWS HAVING DIFFERENT DRAW WEIGHTS

Samuel M. Shobert, 17760 Dragoon Trail, Mishawaka, Ind.

Filed Feb. 6, 1970, Ser. No. 9,358
Int. Cl. B32b *5/08, 5/12*; F41b *5/00*
U.S. Cl. 156—178 5 Claims

An archery bow of reinforced plastic in which each limb includes two contiguous elongated strata of glass fiber concentrations, one stratum defining the back side and the other the belly side thereof, said other stratum constituting the body portion of the limb. At least a portion of the glass fibers are in the form of strands of glass roving extending longitudinally of the limbs. The average number of strands per unit cross-sectional area of the body portion is less than the average number of strands per unit cross-sectional area of said one stratum, the resin material in both being identical.



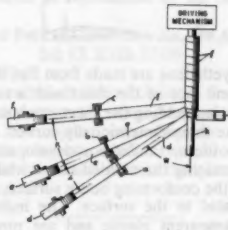
The draw weight of the bow is at least partially determined by the number of strands in said one stratum. The method of fabricating the archery bow of the invention comprises the step of selectively changing the number of strands of glass fiber in said one stratum in a given design of bow whereby draw weight with minimum stacking can be realized in a facile and economical manner.

3,657,041

PROCESS FOR MAKING HELICALLY WRAPPED INSULATION

Harold J. Reynolds, Jr., Raritan, N.J., assignor to Johns-Manville Corporation, New York, N.Y.

Original application Oct. 17, 1968, Ser. No. 768,398, now abandoned. Divided and this application Jan. 5, 1971, Ser. No. 103,970
Int. Cl. B65h *81/04*
U.S. Cl. 156—190 4 Claims

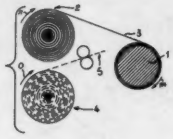


A process for producing a helical laminated tape preferably having at least one strip overlappingly superimposed on another strip of about the same width, including the step of dusting any remaining exposed area of the overlapped tape before forming adjacent coils, whereby subsequently formed adjacent coils do not become bonded during a subsequent cure, thereby resulting in a stepped and tiered tape having overlapping edges for enhanced heat and fire protection, and being easily uncoiled from or subsequently recoilable on any desired cylindrical or tubular mounting means.

3,657,042
PROCESS FOR MANUFACTURE OF LAMINATED SECTIONS

Marc Rerolle, and Jean Besson, both of Lyon, France, assignors to Seprosy Societe Europeenne Pour la Transformation de Produits de Synthese, Paris, France

Filed Jan. 7, 1969, Ser. No. 789,488
Claims priority, application France, Jan. 24, 1968, 49563
Int. Cl. B31c *9/00*
U.S. Cl. 156—190 **2 Claims**



Laminated sections are made by winding a sheet of paper or fabric and a plastics film on to a mandrel in the cold, without any addition. The first and last turns or the spool may be of plastics film alone. Unwinding may be prevented by an adhesive strip on the last turn. The spool after winding is removed and heated at any later time to fuse the plastics film and bond the layers together. A label may be sealed under the last layer of film. A packaging container is made from the section by crimping a disc of similar laminated material on the bottom of the section and heating to ensure liquid-tightness.

3,657,043
METHOD OF LABELING CONTAINERS

Theodor Ploetz, Hosel, and Alfred Sendt, Gutersloh, both of Germany, assignors to Feldmuhle Aktiengesellschaft, Dusseldorf, Germany

Filed May 14, 1970, Ser. No. 37,290
Claims priority, application Germany, May 20, 1969, P 19 25 621.4
Int. Cl. B31f *1/00*
U.S. Cl. 156—196 **6 Claims**

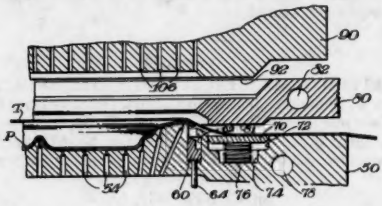
Labels of polyethylene are made from flat, thin sheet stock by imprinting one face of the sheet with a mirror image of the desired indicia, molding the sheet stock until the printed face assumes the three-dimensionally curved, concave shape of a one-way bottle or similar non-developable surface of a container, maintaining the molded shape while applying the printed face to the conforming bottle surface, and adhesively fastening the label to the surface. The indicia are visible through the transparent plastic and are protected by the same.

3,657,044
METHOD OF THERMOPLASTIC COATING OF MOLDED PULP

Max E. Singer, Mattapan, Mass., assignor to Keyes Fibre Company

Continuation of application Ser. No. 376,150, June 18, 1964, now abandoned. This application July 16, 1969, Ser. No. 847,502
Int. Cl. B29c *17/04;* **B32b** *1/02, 1/04, 31/04, 31/20*
U.S. Cl. 156—212 **5 Claims**

A method of coating a contoured portion of a generally porous molded pulp article having sloping side and flat bottom wall portions with generally imperforate thermoplastic material to achieve a superior bonded product. First the article to be coated is placed against an open-face suction die, a flat continuous sheet of thermoplastic material is then placed in overlying relationship with the exposed portion of the die-supported article, the temperature of the thermoplastic material is raised to the range where it is sufficiently ductile to closely conform with the contoured portion of the molded pulp article, the thermoplastic material is suction adhered into intimate physical contact with the article without undesireable pleats or folds, a closed chamber is created around the article and its adhered thermoplastic material with the open-face suction die forming a portion thereof, the pressure within the closed chamber is increased to act against the exposed portion of the thermoplastic material with a pressure at least twice atmospheric pressure, and finally the temperature of the thermoplastic material continues to be raised until

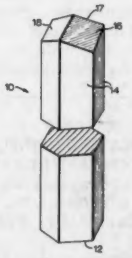


a mechanical bond with the contacted pulp is effected which is characterized in the finished product by a substantially uniform penetration of thermoplastic material into the adjacent pulp material on the sloping side as well as the flat bottom wall portions and the penetration of fibrous pulp material into the adjacent side of the thermoplastic material is also substantially uniform as to both quantity and depth of penetration on the side as well as the bottom wall portions so that a substantially equal amount of force is required to forceably separate the thermoplastic as a sheet from a given area of the bottom wall portions and from a given area of the side wall portions, and so that a substantially uniform amount of pulp material per area unit adheres to the thermoplastic material from the side as well as the bottom wall portions at any place over the bonded surface of the thermoplastic material when it is forceably separated as a sheet from the remainder of the product.

3,657,045
METHOD OF FABRICATING FACETED PIN BUNDLES FOR MOLDING CENTRAL TRIPLE REFLECTORS

Otto Brudy, 559 Askin Boulevard, Windsor 11, Ontario, Canada

Filed Nov. 24, 1969, Ser. No. 879,096
Claims priority, application Great Britain, July 10, 1969, 34,891/69
Int. Cl. B29c *27/00;* **G02b** *5/12*
U.S. Cl. 156—296 **4 Claims**



A method of fabricating a core for molding central triple reflectors. A number of hexagonal, cubically faceted pins are

assembled into a bundle, and clamped into a mold so that the mold walls and the bottom ends of the pins define a recess. A quantity of binding material is placed in the recess and then is compressed against the bottom ends of the pins to drive some of the binding material between the individual pins. The binding material is then hardened and bonds the bundle of pins together.

3,657,046

PROCESS FOR ADHERING RUBBER TO RUBBER OR METAL WITH HALOGENATED TERPOLYMER OF ETHYLENE-α-OLEFIN-NON-CONJUGATED DIOLEFIN

Junji Furukawa; Shinzo Yamashita, both of Kyoto; Kunihiko Ikkaku; Norio Kitahara, both of Kobe; Shozo Maeda, Nishinomiya, and Shigeru Tajima, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan and Sakai Chemical Industry Co., Ltd., Kobe, Japan

Continuation-in-part of application Ser. No. 640,325, May 22, 1967. This application Feb. 4, 1970, Ser. No. 8,751

Int. Cl. C09j *3/12, 5/02*

U.S. Cl. 156—315 **10 Claims**

A lowly or highly unsaturated rubber, such as ethylene-propylene-non-conjugated diolefin terpolymer, isoprene-isobutylene rubber, natural rubber, polyisoprene rubber, polybutadiene rubber, styrene-butadiene rubber, polychloroprene rubber, acrylonitrile-butadiene rubber, is strongly adhered to the same or a different rubber or a metal, such as mild steel or brass, by using, as an adhesive, a halogenated terpolymer of ethylene, an α-olefin other than ethylene, such as propylene, and a non-conjugated diolefin, such as dicyclopentadiene or divinylbenzene, ethylidenenorbornene, 1,4-hexadiene, said halogenated terpolymer having a halogen content of 13 to 50 % by weight. A conventional primer may or may not be used to adhere to the rubber to the metal with the halogenated terpolymer. Adhesion is effected by heating an assembly consisting of the substrates to be bonded and the adhesive interposed therebetween under pressure.

3,657,047

ADHERING WITH AZIDO ISOCYANATE COMPOUNDS

David S. Breslow, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sept. 22, 1969, Ser. No. 860,018

Int. Cl. C09j *5/06, 3/16*

U.S. Cl. 156—322 **5 Claims**

Sulfonazide-isocyanate compounds of the formula

$$(N_3O_2S)_x\text{-}R\text{-}(NCO)_y$$

where R is a polyvalent aliphatic radical and x and y are integers from 1 to 10 are used to adhere polymers to substrates selected from siliceous materials, metals and other polymer substrates. Rubber tires are reinforced with polyester tire cord which has been modified with a sulfonazide-isocyanate compound.

3,657,048

METHOD OF BONDING ELASTOMERIC MATERIALS

John C. Gardner, Lymm, England, assignor to J. H. Fenner & Co. Limited, Marfleet, Hull, England

Filed Nov. 25, 1968, Ser. No. 778,816

Claims priority, application Great Britain, Nov. 28, 1969, 53,995/67

Int. Cl. C09j *3/00*

U.S. Cl. 156—331 **3 Claims**

Polyvinyl chloride is bonded to natural or synthetic elastomers by means of a solution grafted copolymer of an acrylic monomer and a synthetic elastomer. If the elastomer is natural rubber or a sulphur modified chloroprene elastomer, a solution grafted copolymer of methyl methacrylate, butadiene and preferably also acrylonitrile, is used. If the elastomer is a non-sulphur modified chloroprene rubber, a solution grafted copolymer of methyl methacrylate and chloroprene rubber is used.

3,657,049

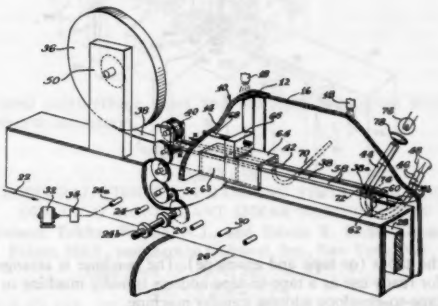
TROUGHED STRIP MONITORING TYPE SPEED CONTROL FOR CONTINUOUS ETCHER

Robert C. Benton, State College, and Blair W. Heffner, Petersburg, both of Pa., assignors to Chemcut Corporation, State College, Pa.

Filed Jan. 13, 1970, Ser. No. 2,574

Int. Cl. H05k *3/00;* **B23p** *15/00*

U.S. Cl. 156—345 **8 Claims**



Automatic speed control apparatus is disclosed which monitors the degree of material removal from a control element strip fed thereto while the strip is being etched away and which, in response to the degree of material removal sensed thereby, and controls the conveying speed of articles being conveyed while being etched in a conveyorized type continuous etcher. The fed strip is thin stock preferably troughed for longitudinal stiffness against buckling and, when push-fed through a spray etching chamber, dissolves away to a point of discontinuity which is reached at or about the location of a monitoring or sensing point in the chamber where a sensing mechanism senses that the body of the strip has or has not undergone the last degree of material dissolution.

3,657,050

BONDING DEVICE EMPLOYING TEMPORARY MAGNETIC ATTACHING MEANS

Edgar P. Regan, Jr., Fairfax, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 12, 1969, Ser. No. 798,673

Int. Cl. B32b *31/00*

U.S. Cl. 156—350 **7 Claims**

An apparatus and method for bonding a first object to the surface of a second magnetic object. Magnets on the first object attach the first object to the magnetic object, spaced therefrom by the magnets, while a special ejector system compresses an adhesive material into the space to secure the two objects together.

3,657,051

TRANSFER PRINTING ADDRESSING MACHING

John P. McCarthy, Randolph, Mass., assignor to Dymo Industries, Inc., Emeryville, Calif.

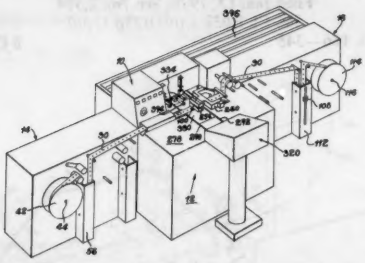
Filed May 27, 1969, Ser. No. 828,226

Int. Cl. B41m *5/18*

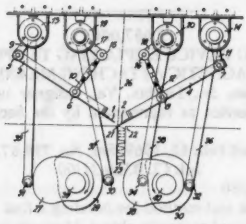
U.S. Cl. 156—384 **9 Claims**

An addressing machine in which a list of addresses of fusible material are transferred from the surface of an elongate relatively transparent address tape to an elongate relatively opaque label tape or directly to envelopes by the application of heat, leaving behind sufficient material on the address tape to enable the address tape itself to be divided into legible address labels. The address tape and label tape or envelopes are advanced intermittently to a printing station where they are

juxtaposed between a heated pad and a platen. The heated pad reciprocates to apply heat to the juxtaposed portions of the tapes (or tape and envelope). The machine is arranged for ready use as a tape-to-tape address transfer machine or a tape-to-envelope address transfer machine.



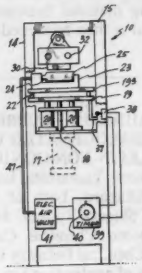
3,657,052
DEVICE FOR PRODUCING NONWOVEN CARPETS
Alfons Debonnet, Rollegem-Kapelle, Belgium, assignor to Makropatent Trust reg., Vaduz, Liechtenstein
Filed Apr. 28, 1969, Ser. No. 819,585
Claims priority, application Belgium, Jan. 6, 1969, 48,677; Mar. 5, 1969, 48,866
Int. Cl. D04h *11/08*
U.S. Cl. 156—435 **1 Claim**



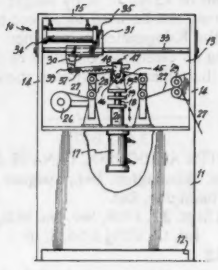
Device for the production of nonwoven carpets wherein two folding blades are each connected to a system of oscillating levers, whereby each system is controlled by a set of cams in such a way that one folding blade is temporarily maintained in its lowest position whilst the second folding blade starts a downward movement and deviates the set of threads.

3,657,053
MECHANISM FOR RIGIDIFYING A COLLAPSIBLE OBJECT
Rubin Warsager, 483 Forest Street, Kearny, N.J.
Filed Mar. 27, 1970, Ser. No. 23,188
Int. Cl. B32b *31/20, 31/12*
U.S. Cl. 156—540 **8 Claims**

A mechanism for rigidifying a collapsible object to be decorated to prevent the object from collapsing as a result of pressure being applied thereto in a hot stamping operation. Air is blown into the object for a period of time and released at the proper time to permit the object to be placed under pressure when a foil is pressed onto its surface.



3,657,054
DECORATING MACHINE FOR TRANSFERRING A DECORATIVE MATERIAL TO AN ARTICLE
Rubin Warsager, 483 Forest Street, Kearny, N.J.
Filed Mar. 27, 1970, Ser. No. 23,396
Int. Cl. B65c *3/16, 9/18*
U.S. Cl. 156—542 **5 Claims**

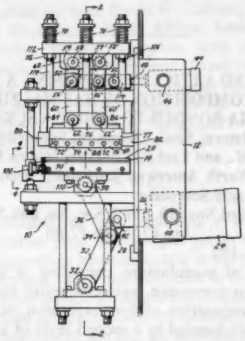


A hot stamping machine for transferring a decorative material to an article in which a pair of rack gears are attached to a carriage holding a die which reciprocates. The rack gears drive two driven gears at the same velocity thereby rotating the object to be decorated and the transfer tape having the decorative material thereon at the same rate of speed to insure a good quality transfer of tape. The object to be decorated is moved up and down into and out of contact with the die. A rack guide is used to maintain the rack gear and the gear driving the object in constant mesh despite the up and down movement of the object.

3,657,055
HEAT SEALING STATION
Matthew Nichols, Norristown, Pa., assignor to Sauter Packaging Company, Souderton, Pa.
Filed June 23, 1970, Ser. No. 49,002
Int. Cl. B30b *15/34, 5/00*
U.S. Cl. 156—583 **14 Claims**

A heat sealing station for laminating superimposed elongate webs of material including an upper heat seal unit and a lower pressure platen in vertical registry, the lower pressure platen having vertical reciprocal motion below the web and the upper heat seal unit having vertical reciprocal motion

above the web, the upper heat seal unit further being characterized by resilient mounting construction to cooperate with



and to absorb the forces generated by operation of the lower pressure platen.

3,657,056

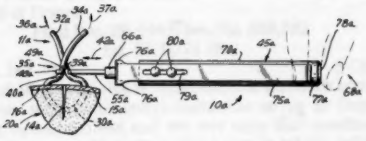
ULTRASONIC SUTURING APPARATUS

Ronald H. Winston, New York, N.Y.; Stephen Schultz, Chapel Hill, N.C., and Thomas Q. Garvey, III, Chevy Chase, Md., assignors to Ultrasonic Systems, Inc., Plainview, N.Y.

Original application Dec. 11, 1967, Ser. No. 689,634, now Patent No. 3,513,848, dated May 26, 1970. Divided and this application Mar. 11, 1970, Ser. No. 18,519

Int. Cl. B29c *27/08;* **B32b** *31/16*

U.S. Cl. 156—580 **7 Claims**



The invention deals with the method and apparatus for forming sutures utilizing ultrasonic vibrational energy as well as the sutures formed thereby. The sutures are formed in biological organisms, such as humans, in a manner to substantially eliminate the loosening of the suture after its formation. In one form of the invention, tie offs in the form of knots as presently practiced are eliminated and overlapping portions of the suture are ultrasonically bonded or welded together without first forming a knot. In another form of the invention the ultrasonic vibrational energy is applied to the knot portion of the suture to prevent slippage and loosening thereof as stresses are applied thereto by normal body movement or in particular by the muscular system. The ultrasonic mechanical vibrations are applied to thermoplastic suture materials that are in either the plastic or metallic family, or of a natural or synthetic polymeric material.

3,657,057

LAMINATED WINDOWS

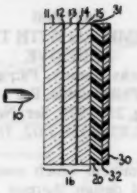
Norman Shorr, Pittsburgh, and Harry E. Littell, Jr., Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 17, 1969, Ser. No. 834,037

Int. Cl. B32b *17/10, 27/40*

U.S. Cl. 161—2 **12 Claims**

Improving the adhesion of a cured sheet of polyurethane to a rigid transparent sheet, such as glass or polycarbonate, by interposing a polymerizable polyurethane resin between the



cured polyurethane sheet and the rigid transparent sheet prior to lamination.

3,657,058

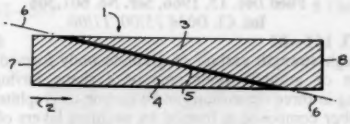
INTEGRAL VIBRATION DAMPING STRUCTURE FOR INDUCING SIGNIFICANT SHEAR DEFORMATION

Noboru Tokita, Wayne, N.J., and Edwin R. Hahn, Grosse Pointe, Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed June 19, 1970, Ser. No. 47,779

Int. Cl. B32b *3/14*

U.S. Cl. 161—37 **15 Claims**



An integral vibration damping structure, comprising a thin layer of damping material interposed between and adhered to a pair of overlapping, elongated rigid members, the layer of damping material being disposed at an angle other than about 90° to the direction of propagation of the vibration to be damped and being deformed in shear when subjected to such vibration, thereby substantially reducing such vibration.

The foregoing abstract is neither intended to define the invention disclosed in this specification, nor is it intended to be limiting as to the scope of the invention in any way.

3,657,059

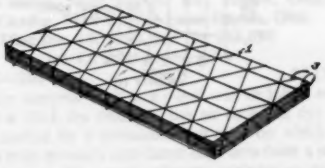
QUASI-ISOTROPIC SANDWICH CORE

Irving E. Figge, Newport News, Va., assignor to The United States of America as represented by the Secretary of the Army

Filed May 20, 1970, Ser. No. 39,596

Int. Cl. B32b *5/12, 5/26*

U.S. Cl. 161—47 **7 Claims**



A structural core consisting of a winding of fibrous filaments which are wound upon a jig, each filament being disposed upon the preceding one whereby the winding defines parallel rows of tetrahedrons, half of which point upwards, the other half downwards. Sandwiched, in spaced

relation, between the windings of filaments are sheets of fiberglas cloth. The dimensions of the sheets are coextensive with the dimensions of the winding.

3,657,060

EMBROIDERED EMBLEM WITH THERMOPLASTIC ADHESIVE

Thomas I. Haigh, Bucks County, Pa., assignor to The Penn Novelty Company, Philadelphia, Pa.

Filed Aug. 25, 1970, Ser. No. 66,715
Int. Cl. B32b *3/02, 3/14*
U.S. Cl. 161—73 **5 Claims**

An embroidered emblem which comprises a fabric base with an embroidered design thereon and a thermoplastic material laminated thereto. The emblem can be fastened to a garment by applying sufficient heat and pressure to melt the thermoplastic material. The method for preparing the laminated emblem comprises the steps of applying heat and pressure to the thermoplastic material while it is in contact with the emblem and then permitting it to cool while still under pressure. A similar technique is utilized for bonding the emblem to a garment.

3,657,061

REINFORCED CARBON AND GRAPHITE BODIES

Walter H. Carlson, Grand Island, and Leo C. Ehrenreich, Buffalo, both of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed Dec. 13, 1966, Ser. No. 601,306
Int. Cl. D03d *15/00, 11/00*
U.S. Cl. 161—81 **6 Claims**

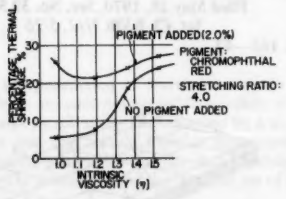
A high strength carbon or graphite body formed from a carbon or graphite fiber composite shape having fibers running in three dimensions and a carbon or graphite matrix. The fiber composite is formed by needling layers of carbon or graphite fibers to position some of the fibers of each layer into a running direction substantially perpendicular to the running direction of the layers.

3,657,062

CRIMPABLE, COLORED POLYPROPYLENE COMPOSITE FIBERS

Shozo Eshima; Isao Fujimura, and Hidenori Nakagawa, all of Shigaken, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Jan. 23, 1970, Ser. No. 5,291
Claims priority, application Japan, Jan. 31, 1969, 44/7185
Int. Cl. D01d *5/28*
U.S. Cl. 161—173 **10 Claims**



These crimpable, coloured polypropylene composite fibers have such a structure that the first portion consisting of polypropylene having a high degree of polymerization and containing pigment and the second portion consisting of polypropylene having a low degree of polymerization and an intrinsic viscosity of 1.35 or less and being substantially free of a pigment, are joined together in an asymmetrical relation with respect to the fiber axis.

Yarns of a high bulkiness, a high elongation and shrinkage and good touch can be prepared from the present composite fibers.

3,657,063

PROCESS AND ARTICLE COMPRISING A LAYER OF A TERNARY COMPOSITION OF HAFNIA; ZIRCONIA AND TITANIA BONDED TO A SILICA SUBSTRATE

Sherman D. Brown, Simi; Thomas F. Schroeder, Los Angeles, both of Calif., and Earl E. Conabee, Morris Plains, N.J., assignors to North American Rockwell Corporation, by said Brown and said Schroeder

Filed Nov. 20, 1967, Ser. No. 686,377
Int. Cl. B32b *17/06*
U.S. Cl. 161—192 **8 Claims**

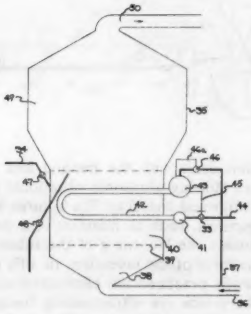
An article of manufacture consisting of a high thermal shock resistant composite, said composite formed of a first layer of a composition of low expansion particulate oxide layer intimately bonded to a second layer of a low expansion preformed silica material. The particulate oxide layer consists essentially of 60 to 85 mole percent hafnia, 10 to 30 mole percent zirconia and 10 to 30 mole percent titania.

3,657,064

DIRECT OXIDATIVE CONVERSION OF SODIUM SULFIDE TO SODIUM SULFITE BY ABSORBING THE HEAT OF REACTION IN A FLUIDIZED BED SYSTEM USING ADIABATIC COOLING

Philip E. Shick, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Sept. 18, 1969, Ser. No. 859,041
Int. Cl. D21c *11/00, 11/12*
U.S. Cl. 162—30 **11 Claims**



Process for simultaneously producing sulfite pulping chemical from a spent pulping medium by the exothermic oxidative conversion of sodium sulfide to sodium sulfite and for the control of the temperature in exothermic reaction and also for employing the exothermic reaction heat to make steam to be mixed with air for use in said oxidation process. Ground particles of a spent pulping smelt are treated in a fluidized bed reactor in intimate contact with moving air enriched with steam for about 10 seconds to 2 hours, wherein the weight ratio of steam to air ranges from about 0.2 to 1 to 1.2 to 1. The temperature in the reactor is adiabatically controlled and the heat of reaction generated in the reactor is absorbed by adiabatic cooling to form the steam used in the reactor.

3,657,065

DELIGNIFICATION AND BLEACHING OF CELLULOSE PULP WITH OXYGEN GAS IN AN ALLSALINE MEDIUM IN THE PRESENCE OF A PROTECTOR

Leon Smith, Petersfield Springs; David W. Calvert, Westdene, Benoni, both of Republic of South Africa; Andre Robert, Meylan, and Andre Viallet, Grenoble, both of France, assignors to South African Pulp and Paper Industries, Limited and L'Air Liquide, Societe Anonyme pour L'Etude et L'Exploitation des Procedes Georges Claude

Filed June 11, 1969, Ser. No. 832,477
Claims priority, application Republic of South Africa, June 13, 1968, 68/3771
Int. Cl. D21c 9/10
U.S. Cl. 162—65 10 Claims

A method of delignifying and bleaching a chemical or semi-chemical cellulose pulp with oxygen gas in an alkaline medium, preferably sodium hydroxide, and in the presence of a protector, the method being characterized in that the protector is selected from the group consisting of silica; an alkali metal silicate, such as sodium silicate; an alkaline earth metal silicate, such as magnesium silicate; an alkaline earth metal phosphate, such as magnesium phosphate; an alkaline earth metal oxide, such as magnesium oxide; an alkaline earth metal peroxide; an alkaline earth metal hydroxide or a material forming an alkaline earth metal hydroxide, such as magnesium hydroxide or a material forming magnesium hydroxide in situ; and a soluble salt of magnesium other than magnesium carbonate.

3,657,066

WET-STRENGTHENED CARBOXYLATED CELLULOSIC MATERIALS CONTAINING MELAMINE FORMALDEHYDE RESIN AND A PROCESS FOR PREPARING THE SAME

Marcel Chene, True Marcel Benoit, Grenoble; Jean Pierre Quiles, Lenomeau Fleauri-villa 93, Momtbommot 38, and Jean Francis Lafaye, 30 rue Edonard Voillant, Grenoble 38, all of France

Filed Dec. 29, 1969, Ser. No. 888,982
Int. Cl. D21d 3/00
U.S. Cl. 162—166 3 Claims

A method of preparing fibrous cellulosic materials containing resins such as trimethylolmelamine so as to improve bonding between fibers and the wet state and conditioned state resistances, said method being one in which cellulose fibers are oxidized with an alkali metal periodate to form aldehyde groups in the 2 and 3 positions, and the aldehyde containing cellulose fibers are then further oxidized with an alkali metal chlorite to form carboxyl groups in the 2 and 3 positions, and the resin precursor is reacted in acidic medium and is mainly retained by an ion exchange mechanism on cellulose fibers, those fibers then being used on paper or cardboard machines; and the new products so obtained.

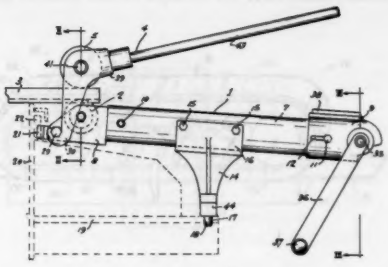
3,657,067

APPRATUS FOR INSTALLING AND REMOVING FOILS FROM PAPER MAKING MACHINES

Derrick Ronald Woodward, Pointe Claire, Quebec, Canada, assignor to JWI Ltd.

Filed Dec. 12, 1969, Ser. No. 884,524
Claims priority, application Canada, Aug. 21, 1969, 060090
Int. Cl. D21g 9/00
U.S. Cl. 162—199 8 Claims

A foil-gripping device attached laterally of a foil unit on the side of a paper making machine which includes a friction roller attached to a tube and support column and positioned to engage the underside of the drainage foil, and a pressure roller connected to the tube by hooked members and operable to apply pressure to the upper side of the drainage foil by a movable lever arm. A drive chain housed within the tube is connected to the friction roller and functions to turn the roller and thereby move the drainage foil laterally of the paper making machine when the pressure roller contacts the upper surface of the drainage foil.

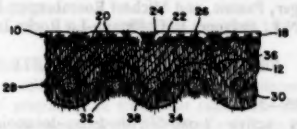


3,657,068

PAPERMAKING FELT

Michael Ivanowicz, Piqua, Ohio, assignor to The Orr Felt Company, Piqua, Ohio

Filed Jan. 7, 1970, Ser. No. 1,241
Int. Cl. D21f 3/00
U.S. Cl. 162—358 5 Claims



A papermaking felt has an essentially three-layer construction including a cushion of non-woven batting material interposed between a relatively fine woven finish fabric and a preferably coarser woven wear fabric, and these respective portions of the felt are anchored together by one or more needling operations. The finish fabric is fine enough weave to prevent undesirable marking of a sheet of paper, and the wear fabric is strong enough in construction to resist the abrasion and wear and open enough to permit water to pass freely through the felt. The intermediate batt is thick enough to resist compression occasioned by the high pressures of normal paper machine speeds and joins the finish and wear fabrics in unitary construction to prevent the fabrics from shifting relative to each other during operation.

3,657,069

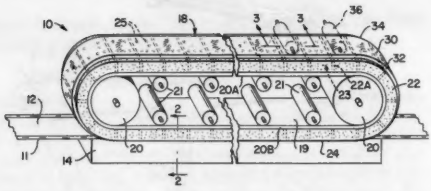
METHOD AND APPARATUS FOR TREATMENT OF SHEET-LIKE MATERIAL

Robert R. Candor, 5940 Munger Rd., Dayton, Ohio, and James T. Candor, 5440 Cynthia Lane, Dayton, Ohio

Filed Dec. 18, 1969, Ser. No. 886,090
Int. Cl. D21f 11/00, 5/08
U.S. Cl. 162—205 10 Claims

A sheet-like material such as a paper web or fabric web is treated with a fluid, for example, hot air or liquid dye. The material is carried by a permeable felt wire on which it is subjected to both pressure and direct fluid flow from a movable nozzle element. The nozzle element includes an endless support member driven by a pair of rollers and an outer flexible, chambered belt or sheet. The chambers of the flexible belt are provided with inlets through which the treating fluid, under pressure, is delivered thereto. The chambers are further provided with outlets or openings which allow the

treating fluid to pass from the chambers. A porous sheet or belt is placed and secured around the flexible, chambered belt. In operation the sheet-like material passes through the apparatus on the permeable wire with the nozzle element



moving in unison therewith. The treating fluid passes from the chambered belt, through the porous sheet into the material, with the pressure from the treating fluid maintaining the flexible belt, the porous sheet and material in a substantially sealed relation throughout the apparatus.

3,657,070

MICROBIOLOGICAL PREPARATION OF OPTICALLY ACTIVE 9-OXO-5(S)-HYDROXY-DECANOIC ACID AND THE LACTONE THEREOF

Julius Berger, Passaic, and Michael Rosenberger, Bloomfield, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed July 22, 1970, Ser. No. 57,371
Int. Cl. C12d *13/00*

U.S. Cl. 195—30 **7 Claims**

Optically active 9-oxo-5(S)-hydroxy-decanoic acid is prepared by selective microbiological reduction of 5,9-dioxodecanoic acid. The product acid is converted to levorotatory 9-oxo-5(S)-hydroxy-decanoic acid lactone by treatment of the reaction medium with a strong mineral acid. The aforesaid lactone is useful as an intermediate in the total synthesis of medicinally valuable, optically active steroids.

3,657,071

FRACTIONATION OF PROTEINS

Hans Ulrich Bergmeyer, Tutzing/Oberbayern, Bahnhofstrasse 5a., and Hans Mollering, Tutzing/Oberbayern Waldschmidtstrasse 5., both of Tutzing/Oberbayern, Germany

Filed Nov. 12, 1968, Ser. No. 775,197
Int. Cl. C07g *7/02*

U.S. Cl. 195—66 R **1 Claim**

Process for fractionating proteins comprising subjecting a protein containing material to a sequence of treatment steps involving salts containing no heavy metal ions and uranyl acetate.

3,657,072

EPOXIDATION OF CIS-PROPENYLPHOSPHONIC ACID

Raymond F. White, Englishtown, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 5, 1969, Ser. No. 874,387
Int. Cl. C12d *9/00*

U.S. Cl. 195—81 **10 Claims**

Cis-propenylphosphonic acid and its salts are converted to (−)(cis-1,2-epoxypropyl)phosphonic acid by intimately contacting said acid or salts with epoxidizing enzymes of molds. The epoxyphosphonic acid and its derivatives are valuable antibiotics active against gram-positive and gram-negative bacteria.

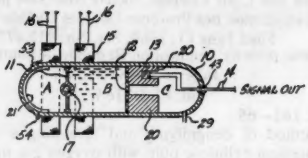
3,657,073

APPARATUS FOR DETECTING VIABLE ORGANISMS

George M. Burton, Burton; Gerald M. Christensen, and Arthur J. Pilgrim, both of Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed May 12, 1966, Ser. No. 549,717
Int. Cl. C12b

U.S. Cl. 195—127 **9 Claims**



A three chamber sterilization efficiency detector having a first chamber containing viable organisms that are subjected to the sterilization process; a second chamber separated from the first by an openable partition containing nutrient media; and a third chamber separated from the second by a semi-permeable partition containing means for detecting the products of the life processes of the organisms. After sterilization, the openable partition is opened to allow the nutrient media to contact the organisms and support the life processes of any surviving organisms and the products of such life processes pass through the semi-permeable partition to be detected in the third chamber.

3,657,074

PURIFICATION OF PYRUVALDEHYDE

John S. Warner, Columbus, Ohio, assignor to Wm. Wrigley, Jr. Company, Chicago, Ill.

Filed Mar. 21, 1968, Ser. No. 714,807
Int. Cl. B01d *3/34*

U.S. Cl. 203—52 **10 Claims**

A process for the purification of pyruvaldehyde which comprises the gradual addition of a crude aqueous solution of pyruvaldehyde, containing amounts of color bodies, and polymeric products to a water-immiscible liquid maintained at a temperature of about 80° C. to about 200° C. at atmospheric or reduced pressure, and preferably of an inert atmosphere, and collecting the pyruvaldehyde. The purified pyruvaldehyde is recovered as the aqueous phase from a condensed azeotype. Suitable water-immiscible liquids include mineral oil, petroleum solvents, tetrachloroethane, orthodichlorobenzene, and other high-boiling hydrocarbons and halohydrocarbons.

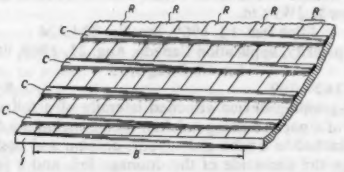
3,657,075

METHOD OF FABRICATING MEMORY MATRIX PLANES USING FERROMAGNETIC THIN FILM

Shintaro Oshima; Toshihiko Kobayashi, both of Tokyo-to, and Tetsusaburo Kamibayashi, Kitaadachi-gun, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 18, 1968, Ser. No. 760,529
Claims priority, application Japan, Sept. 18, 1967, 42/59423
Int. Cl. C23b *5/48, 5/46*

U.S. Cl. 204—15 **7 Claims**



A method of fabricating a memory matrix plane using ferromagnetic thin films, in which a composite film comprising

a ferromagnetic thin film, a copper layer, and a chromium layer, is deposited on a glass substrate and is photoetched so as to obtain spaced parallel lines. Ferromagnetic layers are electroplated on the separate lines to coat the copper layer, and the chromium layer together with the ferromagnetic thin film at each of the separate lines, thereby obtaining row lines. Column lines are deposited, through an insulation layer, on the row lines so as to be orthogonally arranged to the row lines by evaporative deposition or adhesive deposition.

3,657,076

METHOD OF BONDING QUARTZ TO METAL

Marvin Bernstein, Asbury Park, N.J., assignor to The United States of America as represented by the Secretary of the Army

Filed Dec. 17, 1970, Ser. No. 99,288
Int. Cl. C23b *7/00, 5/60;* **B23k** *31/02*
U.S. Cl. 204—16 **5 Claims**

A quartz surface is bonded to a metallic surface such as stainless steel. The method involves the sequential vacuum evaporation of chromium, copper and chromium, and copper onto the quartz surface to form in superposition, a chromium film, a copper-chromium film, and a copper film in that order on the quartz surface. The quartz surface bearing these superimposed films is then placed in electrical and physical contact with the stainless steel surface to which it is to be bonded and immersed in an electroplating solution of an electroplatable metal. An electrode composed of said electroplatable metal is also immersed in the electroplating solution. The exposed stainless steel surface is then electrically connected to the negative terminal of a suitable power supply, and the electrode of said electroplatable metal electrically connected to the positive terminal of the power supply. A variable current limiting resistor and milliammeter are series connected to the terminals of the power supply and a suitable plating current is then passed through the solution.

3,657,077

PROCESS FOR THE TREATMENT OF ANODIC OXIDIZED ALUMINUM SURFACES

Hans Gunther Germscheid, Hosel, and Roland Geisler, Dusseldorf-Holthausen, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed July 8, 1970, Ser. No. 53,317
Claims priority, application Germany, Sept. 2, 1969, P 19 44 452.1
Int. Cl. C23f *17/00*
U.S. Cl. 204—35 N **4 Claims**

An improvement in the treatment of anodic oxidized aluminum surfaces with subsequent sealing with hot water or steam. The improvement comprises either an intermediate treatment or a combined treatment with the sealing of the aluminum surfaces at temperatures of from 150° C to 100° C with a solution of dextrin. The treatment prevents the formation of sealing films without impairing the anodic oxide coating or the quality of the after-sealing.

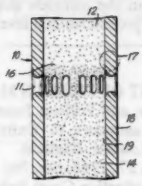
3,657,078

METHOD OF PRODUCING CYLINDER LINERS WITH DIFFERENT DEGREES OF ROUGHNESS IN HIGH AND LOW PRESSURE AREAS

Ernest W. Schweikher, Waterbury, Conn., assignor to Chromium Corporation of America, Waterbury, Conn.

Filed July 30, 1969, Ser. No. 854,345
Int. Cl. C23f *17/00*
U.S. Cl. 204—35 R **7 Claims**

A lining is provided for an internal combustion engine cylinder in which different degrees of roughness are imparted to those portions of the lands of the liner surface subjected to low and high pressures. The lands of the low pressure portions of the cylinder liner have a high degree of roughness for providing lubrication pockets for cooling the compression rings and for providing lapping of the rings during break-in so as to conform those surfaces in relative movement with each other. The lands of the high pressure portions of the cylinder liner have a low degree of roughness for reducing the oil retaining capacity thereof adjacent the combustion chamber



for in turn eliminating the burning of lubricating oil while simultaneously presenting a relatively smooth surface to the compression rings during the time they are under high pressure in order to eliminate cocking of the rings and scoring of the liner.

3,657,079

NOVEL PROCESS AND PRODUCT

Hyman Chessin, Birmingham, and Robert Francis Gempel, Detroit, both of Mich., assignors to M & T Chemicals Inc., New York, N.Y.

Filed Feb. 6, 1969, Ser. No. 797,258
Int. Cl. C23b *5/06*
U.S. Cl. 204—51 **4 Claims**

This invention relates to novel compositions and to a process of preparing an iridescent chromium plated article which comprises passing current from an anode to a cathode through an aqueous chromium plating solution which contains at least one chromium compound providing chromium metal ions for electroplating chromium and a hexavalent molybdenum compound to produce an iridescent chromium surface on said cathodic article.

3,657,080

MIST SUPPRESSION IN ELECTROPLATING SOLUTIONS

Hyman Chessin, Birmingham, Mich., assignor to M & T Chemicals Inc., New York, N.Y.

Filed Sept. 25, 1968, Ser. No. 762,624
Int. Cl. C23b *5/06*
U.S. Cl. 204—51 **8 Claims**

In accordance with certain of its aspects, this invention relates to novel compositions and to a process for suppressing mist formation in an aqueous composition which comprises incorporating hydrophobic particles having a particle size of 0.002-100 microns into said aqueous compositions. The process is applicable, for example, to chromium electroplating solutions.

3,657,081

PROCESS FOR RECOVERY OF METALS

W. Church Holmes, 100 South St., Sausalito, Calif.

Filed Nov. 9, 1970, Ser. No. 88,088
Int. Cl. C22b *31/00;* **B01k** *1/00*
U.S. Cl. 204—105 R **7 Claims**

The process of recovering antimony from stibnite concentrate and other minerals or products containing the same which comprises contacting the concentrate with a solution of an alkali metal sulphide in a leaching circuit, electrolyzing the resultant pregnant solution in a diaphragm cell by utilizing said solution as the catholyte and a solution of the barren, or stripped catholyte and caustic alkali as the anolyte,

whereby oxidation products of sulphide sulphur are formed in the anolyte, treating all or part of the resulting oxidized anolyte with chlorine gas for the precipitation of its contained antimony and sulphide sulphur prior to its discard, recovering the antimony content of the precipitate and returning the same to the leaching circuit, and removing sufficient sulphur in the process as sodium sulphate and elemental sulphur to maintain the sulphide sulphur content of the leaching solution at a predetermined level.

3,657,082

TREATMENT OF FIBROUS MATERIALS

Henry Wells, Wantage, and William James Colclough, Didcot, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 27, 1968, Ser. No. 787,558

Claims priority, application Great Britain, Jan. 3, 1968, 525/68

Int. Cl. C01d *7/34*

U.S. Cl. 204—130 **2 Claims**

In order to improve the surface characteristics of carbon fibers, e.g. their adhesion to a resin matrix, they are treated by immersion in an aqueous oxidising agent, e.g. a hypochlorite.

3,657,083

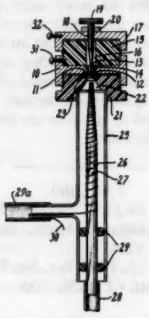
DISC JET ELECTROPOLISHING APPARATUS AND METHOD

Jay Michael Larson, Rte. 1, Box 600, Monroe, N.Y.; Douglas Hugh Polonis, 46th N.E., Seattle, Wash., and Raymond Taggart, 6445 N.E. 130th Place, Seattle, Wash.

Filed Sept. 30, 1970, Ser. No. 76,678

Int. Cl. C23b *3/06;* **B01k** *3/00*

U.S. Cl. 204—140.5 **7 Claims**



Jet electropolishing apparatus and method for preparation of thin foil specimen discs for transmission electron microscopy, including means responsive to passage of electrolyte through the specimen for terminating both the flow of electric current and the flow of electrolyte.

3,657,084

METHOD OF MOUNTING ELECTRODE

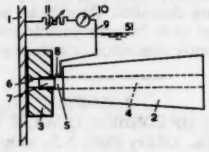
Ernst Beer, Zorgvlietstraat 176, The Hague, Netherlands, and Henri Bernard Beer, Vogelengangstraat 33, Kalmthout, Belgium

Continuation of application Ser. No. 665,178, Sept. 1, 1967, now Patent No. 3,513,082, which is a continuation of application Ser. No. 341,003, Jan. 29, 1972, now abandoned. This application Dec. 3, 1969, Ser. No. 881,767. The portion of the term of this patent subsequent to May 19, 1988, has been disclaimed.

Int. Cl. C23f *13/00*

U.S. Cl. 204—147 **4 Claims**

A method of cathodically protecting a ferrous metal object against corrosion in an electrolyte. A magnet of high dielectric ceramic material has a protecting electrode mounted thereon and is placed with the electrode thereon against the object to be protected with the magnet directly against the object. The electrode is electrically connected to the object



to be protected through a path outside the magnet. The electrode is secured tightly to the object by the magnet and it also acts to electrically insulate the electrode from the object to be protected.

3,657,085

METHOD OF MARKING A TRANSPARENT MATERIAL

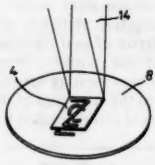
Dietrich Hoffmeister, Oberkochen, and Fritz Schleich, Wasseralfingen, both of Germany, assignors to Carl Zeiss-Stiftung, Carl Zeiss, Wuerttemberg, Germany

Filed Mar. 6, 1969, Ser. No. 804,848

Claims priority, application Germany, Mar. 13, 1968, P 16 96 714.9

Int. Cl. B01j *1/10*

U.S. Cl. 204—157.1 R **8 Claims**



An identification mark is made on a transparent workpiece, such as a lens for spectacles, by irradiating the material in a pattern desired for an identification mark with radiations which produce localized permanent stresses in the material that are visible by double refraction in polarized light. Suitable irradiation may be provided by corpuscular radiation, as by an electron beam, or electromagnetic radiation, as by laser beams. The radiation is preferably applied in an amount to produce the stresses within the material, not on the surface.

3,657,086

RACEMIZATION OF OPTICALLY ACTIVE TRANSCYCLOPROPANECARBOXYLIC ACIDS AND THEIR DERIVATIVES

Masanao Matsui, Tokyo, and Kenzo Ueda, Nishinomiya, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Filed Mar. 16, 1970, Ser. No. 20,059

Claims priority, application Japan, Mar. 24, 1969, 44/22559

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 R **3 Claims**

A method for racemizing optically active transcyclopropanecarboxylic acids and their derivatives comprising dissolving the compound in an inert solvent which is transparent to ultraviolet rays and irradiating the solution with ultraviolet rays in the presence of a photo-sensitizer.

3,657,087

METHOD FOR OXIDIZING A MERCAPTAN COMPOUND DISPERSED IN AIR

John W. Scott, 2020 Edson Drive, Beaumont, Tex.

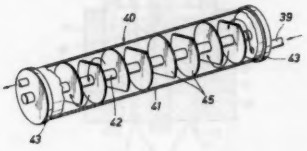
Filed July 24, 1969, Ser. No. 844,274

Int. Cl. B01j *1/10*

U.S. Cl. 204—158 R **7 Claims**

An apparatus and method for oxidizing low concentrations of mercaptan compounds in air at ambient or room tempera-

ture by using ultra-violet light, preferably from a low pressure mercury vapor lamp to supply the activation energy. The dispersion of the mercaptan compound and air is flowed through a reactor chamber and contacted with the ultra-violet light therein. Means may also be provided for contacting the dispersion with mercury vapor in the chamber to thereby increase the rate of oxidation. The resulting effluent



from the method and system has a reduced concentration of noxious odor producing compounds, such that the method and system may be used in reducing air pollution, for example.

3,657,088

MOULDING AND COATING MASSES HARDENABLE BY UV IRRADIATION

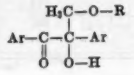
Hans-Georg Heine; Karl Fuhr, both of Krefeld; Hans Rudolph, Krefeld-Bockum, and Hermann Schnell, Krefeld-Uerdingen, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of application Ser. No. 837,865, June 30, 1969, now abandoned. This application Dec. 17, 1969, Ser. No. 885,986

Int. Cl. B01j *1/00;* **C08d** *1/00*

U.S. Cl. 204—159.15 **6 Claims**

The invention relates to compounds and mixtures of compounds polymerisable by UV-irradiation which contain α-substituted benzoins of the formula



in which Ar stands for the unsubstituted phenyl radical or a phenyl radical substituted by lower alkyl having up to about 4 carbon atoms, methoxy, ethoxy or halogen, and R stands for hydrogen or acetyl, and the production of polymeric compounds thereof.

3,657,089

PROCESS FOR PRODUCTION OF FIBROUS CARBIDES, NITRIDES OR BORIDES OF TITANIUM AND ZIRCONIUM

Takehiko Takahashi, 4-81, Ueda-Umemorizaka, Tenpaku-cho, Syowa-ku, and Kozo Sugiyama, 1-8, Naruko-cho, Midoui-ku, both of Nagoya-Aichi, Japan

Filed Jan. 6, 1970, Ser. No. 1,026

Claims priority, application Japan, Jan. 7, 1969, 44/1169

Int. Cl. B01k *1/00;* **C01b** *31/30, 35/00*

U.S. Cl. 204—164 **7 Claims**

A process for producing fibrous carbides, nitrides and borides of titanium or zirconium wherein the reaction is affected by subjecting a titanium or zirconium halide to an electrical discharge of 0.1mA to 20mA between electrodes with an alternating current of less than 3,000 cycles per second.

3,657,090

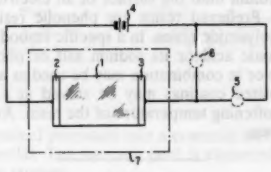
FERROELECTRIC POLING OF FILLED TUNGSTEN BRONZES

Hyman Joseph Levinstein, Berkeley Heights; Shobha Singh, Summit, and Le Grand Gerard Van Uitert, Morris Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 22, 1970, Ser. No. 4,913

Int. Cl. C04b *35/00*

U.S. Cl. 204—164 **8 Claims**



Poling of ferroelectric tungsten bronze-like crystalline material in which the cation sites are substantially filled is expedited by electrolysis at temperatures in excess of the ferroelectric Curie temperature for periods of the order of one hour for bodies one centimeter in length. Electrolysis is carried out in an atmosphere which will yield positive ions such as H^+, D^+ and Li^+ which migrate through the body during processing.

3,657,091

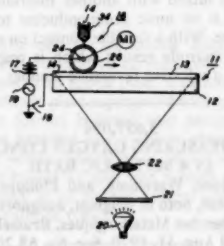
ELECTROPHORETIC IMAGING METHOD EMPLOYING A PERIODIC ELECTRIC FIELD

Edward Forest, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Oct. 3, 1968, Ser. No. 764,715

Int. Cl. C23b *13/00;* **G03g** *13/00*

U.S. Cl. 204—181 **15 Claims**



Method and apparatus for improving image density, contrast and quality and photographic speed in an electrophoretic imaging system utilizing a particulate suspension for forming the image. The method and apparatus stress a thin layer of the electrophoretic suspension of particles in a carrier on an electrode during imaging by applying a high frequency pulsed or varying electric field across the imaging suspension.

3,657,092
PROCESS FOR ELECTRODEPOSITION

Hannes Fischer, Wiesbaden-Biebrich, and Alfred Kuhlkamp, Hofheim/Tanus, both of Germany, assignors to Chemische Werke Albert, Wiesbaden-Biebrich, Germany

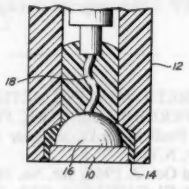
Filed Aug. 18, 1969, Ser. No. 851,094
Claims priority, application Germany, Aug. 20, 1968, P 17 96 033.9
Int. Cl. B01k 5/02
U.S. Cl. 204—181 10 Claims

A process for electrodepositing a water-insoluble synthetic condensation resin having a particle size of at least 0.1 μ and generally at most 30μ from a suspension of said resin in an aqueous medium onto the surface of an electrically conductive article. Preferred resins are phenolic resins, polyester resins and polyamide resins. In a specific embodiment polyvinyl phosphonic acid or its sodium salt or phosphoric acid either alone or in combination may be used as additives. The electrodeposited coatings may be stoved at a temperature above the softening temperature of the resin. Articles coated by this process.

3,657,093
ION SELECTIVE ELECTRODE FOR ACTIVITY DETERMINATION OF CATIONS WHICH DO NOT FORM AS IONIC SEMICONDUCTORS

Gerard M. Farren, Lombard, Ill., assignor to The Perkin-Elmer Corporation

Filed Mar. 3, 1970, Ser. No. 16,073
Int. Cl. G01n 27/46
U.S. Cl. 204—195 6 Claims



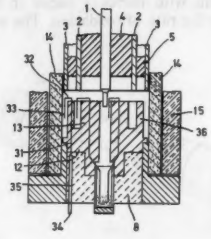
A solid membrane ion-selective electrode is described which is capable of measuring the activity of a cation, e.g., Ca^{++}, which does not form an ionic semiconductor. A low solubility fluoride salt of the cation which is not an ionic semiconductor is mixed with another fluoride salt of lower solubility which is an ionic semiconductor to form an imporous membrane. With a suitable contact on one face of the membrane, an electrode results which is responsive to the desired cation in a selective reversible manner.

3,657,094
DEVICE FOR MEASURING OXYGEN CONCENTRATION IN A METALLIC BATH

Andre Nicolas Hans, Waremme, and Philippe Felix Catoul, Horion-Hozemont, both of Belgium, assignors to Centre Nationale de Recherches Metallurgiques, Brussels, Belgium

Filed Aug. 31, 1970, Ser. No. 68,208
Claims priority, application Belgium, Apr. 7, 1970, 748,622; July 16, 1970, 42,919
Int. Cl. G01n 27/46
U.S. Cl. 204—195 23 Claims

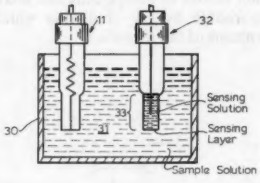
The device is a probe comprising a measurement cell detachably connected to a holder. The holder has three electrically conductive co-axial tubes separated by insulating spacers. The cell has a heat resistant sheath which receives the external tube of the holder. Received within the sheath is a housing having a cavity which extends through it and receives the central tube of the holder. A hollow tube held by the housing contains an electrode, a thermo-couple, and a layer of powdery material providing thermal contact between the thermo-couple junction and the housing. Three contact elements are respectively connected to the two thermo-couple leads and another electrode, and make respective electrical contact with the central, intermediate, and external tubes of the holder.



3,657,095
ELECTRODE SYSTEM FOR MEASURING ION ACTIVITY HAVING SENSING AND UNKNOWN SOLUTIONS IN DIRECT CONTACT

Daniel C. Tosteson, Durham, N.C., assignor to Duke University, Inc., Durham, N.C.

Filed July 14, 1969, Ser. No. 841,393. The portion of the term of the patent subsequent to Oct. 26, 1988, has been disclaimed.
Int. Cl. G01n 27/30
U.S. Cl. 204—195 5 Claims



Measurement of the activity of a particular chemical species of ion, e.g. potassium ion, in an aqueous solution is obtained by means of a selective element which contains an ion selective macrocyclic compound and which is dissolved to form a non-aqueous phase. During sensing, the aqueous and non-aqueous phases make direct contact.

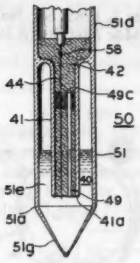
3,657,096
REFERENCE ELECTRODE CONSTRUCTION

William Earl Proctor, Jr., Norristown, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Dec. 19, 1969, Ser. No. 886,555
Int. Cl. G01n 27/30
U.S. Cl. 204—195 9 Claims

A reference electrode structure comprised of a tube, preferably glass, having an immersion end and a connector end. A substantial portion of the length of the tube is filled from its immersion end with a solidified mass of a suitable molten metal salt, such as silver chloride. An electrical conductor at least an end of which consists of the metal of the metal salt, such as silver, extends completely through the solidified mass of metal salt and projects from each end of the mass of metal salt. The portion of the conductor which consists of the metal of the metal salt is disposed in and pro-

jects from the mass of metal salt at the immersion end of the tube. The other end of the conductor is available for connecting the electrode structure to a measuring system. The



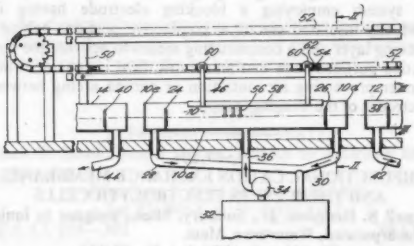
structure may be incorporated as a part of a glass electrode structure or a reference half-cell including a salt-bridge tube with a liquid junction.

3,657,097

SELECTIVE PLATING MACHINES

Alfred James Baldock, Crowthorne, and John Joseph Miles, Huyton, both of England, assignors to Kirkby Process and Equipment Limited, Kirkby, Lancashire, England

Filed Feb. 4, 1970, Ser. No. 8,598
Int. Cl. C23b *5/68;* **B01k** *3/00*
U.S. Cl. 204—202 **10 Claims**



Electro-plating machines are described, which enable plating to be carried out selectively, but using tanks for electrolytes and other treating liquids which include weirs adjustable in height so as to allow adjustment of the heights of the treating liquids. The objects to be plated are desirably mounted from a trackway, preferably formed by the current busbar, and are moved along the trackway by means of a transport system.

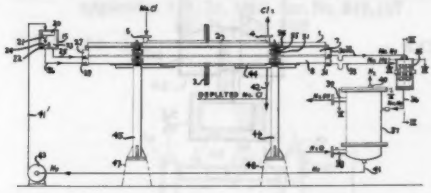
3,657,098

BIPOLAR ELECTROLYSIS CELLS WITH MERCURY CATHODE AND HAVING NOVEL AMALGAM SPLITTING VESSEL

Carl W. Raetzsch; John F. Van Hoozer, and Hugh Cunningham, all of Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Original application Nov. 12, 1964, Ser. No. 410,579, now abandoned. Divided and this application Jan. 31, 1969, Ser. No. 795,665
Int. Cl. C22d *1/04;* **B01k** *3/00*
U.S. Cl. 204—219 **1 Claim**

Disclosed is a bipolar, mercury cathode, electrolytic cell for the electrolysis of brine. Mercury amalgam is removed from each individual cell through separate lines and fed to a mercury amalgam splitter. Mercury amalgam splitter contains a separate compartmentalized wheel for each inlet stream of amalgam. The compartmentalized wheel is caused to rotate and to drop the mercury from separate streams of



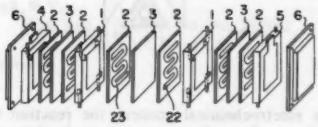
different electrical potentials into a common mercury pool at a single potential. The mercury pool is electrically insulated from separate streams.

3,657,099

ELECTROLYTIC CELL FOR PRODUCING ADIPONITRILE BY ELECTROLYTIC HYDRODIMERIZATION OF ACRYLONITRILE

Maomi Seko, Tokyo; Akira Yomiyama, Nobeoka; Tetsuya Miyake, Nobeoka; Koji Nakagawa, Nobeoka; Muneo Yoshida, Nobeoka, and Koji Inada, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 1, 1970, Ser. No. 33,630
Claims priority, application Japan, May 7, 1969, 44/34499
Int. Cl. B01k *3/10*
U.S. Cl. 204—253 **10 Claims**



An electrolytic cell for producing adiponitrile by electrolytic hydrodimerization of acrylonitrile, which comprises one or more sets of an anode plate, a cation exchange membrane and a cathode plate superposed with each other, and at least one duct formed between said anode plate and said membrane and between said cathode plate and said membrane through which electrolyte is passed at a high flowing rate, said duct having at least one turning portion which is positioned outside of an electric current path flowing across the anode and cathode plates.

3,657,100

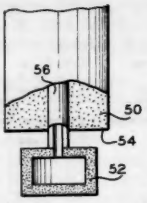
CURRENT-CARRYING SPARGER FOR INTRODUCING FEED TO POROUS ELECTRODE

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company

Original application June 24, 1968, Ser. No. 739,508, now abandoned. Divided and this application Aug. 26, 1970, Ser. No. 67,059
Int. Cl. B01r *3/04;* **C23b** *5/74*
U.S. Cl. 204—284 **5 Claims**

In an electrochemical process, the reaction takes place within the confines of a porous electrode element. The feed

materials are introduced into the bottom of this porous electrode element by means of a sparger which is positioned



beneath the electrode element but within the bulk of the electrolyte and which is a current-carrying component of the electrode assembly.

3,657,101
SPARGER FOR INTRODUCING FEED ADJACENT TO BOTTOM OF POROUS ELECTRODE

Homer M. Fox; Forrest N. Ruehlen, and Keith A. Williams, all of Bartlesville, Okla., assignors to Phillips Petroleum Company

Original application June 24, 1968, Ser. No. 739,476, now abandoned. Divided and this application Aug. 28, 1970, Ser. No. 67,951
Int. Cl. B01r *3/04;* **C23b** *5/74*
U.S. Cl. 204—284 **19 Claims**

In an electrochemical process, the reaction takes place within the confines of a porous electrode element. The feed materials are introduced into the bottom of this porous electrode element by means of a sparger which is positioned within the bulk of the electrolyte adjacent a bottom surface of said electrode element.

3,657,102
ELECTROLYTIC ANODE

Carl D. Keith, Summit; Alfred J. Haley, Jr., Florham Park, and Robert M. Kero, Cranford, all of N.J., assignors to Engelhard Minerals & Chemicals Corporation

Continuation-in-part of application Ser. No. 786,438, Dec. 23, 1968. This application Nov. 28, 1969, Ser. No. 880,932
Int. Cl. B01k *3/04*
U.S. Cl. 204—290 F **5 Claims**

An improved anode for the electrolysis of brines is comprised of a corrosion resistant valve metal substrate, a thin porous adherent exterior coating of a refractory oxide which is inert to the electrolysis cell environment, and between the substrate and exterior coating a thin layer of ruthenium oxide.

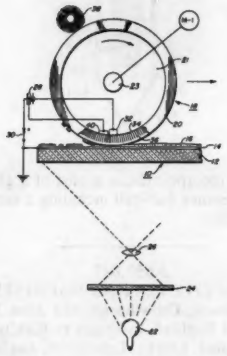
ERRATUM

For Class 204—299 see:
Patent No. 3,657,260

3,657,103
ELECTRODE IMAGING SYSTEM

Donald J. Fisher, Fairport, N.Y., and Robert G. Davies, Clarksville, Va., assignors to Xerox Corporation, Rochester, N.Y.

Filed May 2, 1969, Ser. No. 821,257
Int. Cl. B44c *1/04;* **B01d** *59/42, 5/00*
U.S. Cl. 204—299 **16 Claims**

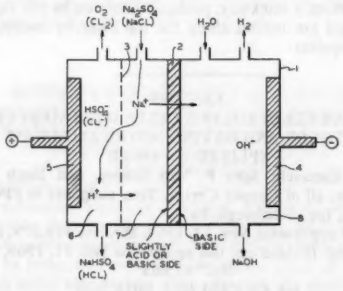


Method and apparatus for improving imaging and eliminating corona arcing during imaging of an electrophoretic imaging system employing a blocking electrode having individually insulated electrical conductive portions behind a blocking layer and a commutating means to activate the conductive portions such that an electric field is generated in a manner preventing air ionization or corona arcing between electrodes of the imaging system.

3,657,104
BIFUNCTIONAL CATION EXCHANGE MEMBRANES AND THEIR USE IN ELECTROLYTICCELLS

Russell B. Hodgdon, Jr., Sudbury, Mass., assignor to Ionics, Incorporated, Watertown, Mass.

Filed Nov. 5, 1970, Ser. No. 87,093
Int. Cl. B01d *13/02*
U.S. Cl. 204—301 **1 Claim**



A cation exchange membrane containing functional groups of both the sulfonic acid and carboxylic acid radicals which allows the membranes to maintain its conductivity

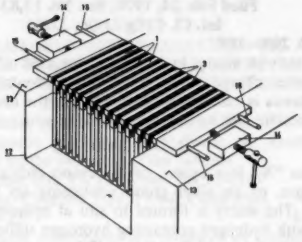
throughout the entire pH range. This unique property gives this high capacity —pH insensitive membrane particular value in electrolytic cells as hydraulic diaphragms to separate a basic solution from an acid solution as is encountered in caustic-chlorine cells or other type cells which electrolytically decompose neutral salt solutions such as sodium sulfate into their basic and acidic components of caustic soda and sodium acid sulfate. The capacity of this membrane is much higher than the presently known sulfonic acid salt types.

3,657,105

ELECTRODIALYSIS APPARATUS

Willem In't Veld, Beverwijk, Netherlands, assignor to Werkspoor Water N.V., Amsterdam-Buitenveldert, Netherlands

Filed Nov. 2, 1970, Ser. No. 86,232
Int. Cl. B01d *13/02*
U.S. Cl. 204—301 **2 Claims**



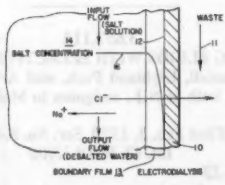
An electrodialysis apparatus with diluate and concentrate chambers, the one type being formed by a free fluid space, the other type by membrane bags hanging in said space.

3,657,106

ELECTRO-OSMOSIS SYSTEM

Jack D. Smith, Boston, Mass., assignor to American Bioculture, Inc.

Filed June 5, 1969, Ser. No. 830,688
Int. Cl. B01d *13/02*; C02b *1/82*
U.S. Cl. 204—301 **10 Claims**



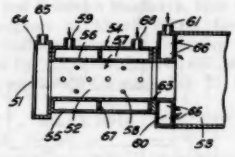
A desalting system making use of electro-osmosis is similar to conventional electrodialysis arrangements in that the input solution is passed between a pair of membranes one of which is anion permeable and the other cation permeable, an applied electric field causing the anions and cations to leave the solution by migrating through the respective membranes. However, unlike conventional electrodialysis membranes, the membranes are also relatively permeable to water. The resulting flow of water toward and through the membranes materially increases the rate at which ions are transported to the membranes and correspondingly increases the rate at which ions are removed from the input solution.

3,657,107

APPARATUS FOR OXIDIZING A METAL HALIDE

John Dennis Herriman, Great Ayton, and Alan Lawrence Hare, Redcar, Teesside, both of England, assignors to British Titan Limited, Billingham, England

Original application Mar. 11, 1966, Ser. No. 533,527, now Patent No. 3,464,792, dated Sept. 2, 1969. Divided and this application Apr. 25, 1969, Ser. No. 819,167
Int. Cl. C22d *7/08*
U.S. Cl. 204—323 **8 Claims**



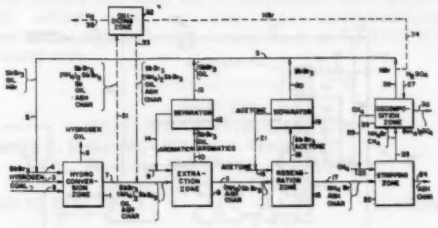
An apparatus for oxidizing a metal halide, such as titanium tetrachloride, includes an electric arc device adapted to heat a gas passed therethrough to at least 2,000° C. and having an orifice through which the heated gas passes to an injection device defining a primary reaction zone which includes a metal wall having a plurality of inlets communicating with the reaction zone, the inlets being fed from a common supply manifold, the injection zone communicating with a second reaction zone, with heat exchange means positioned between the first and second reaction zones.

3,657,108

REGENERATION OF METAL HALIDE CATALYST

Thomas E. Klovsky, El Sobrante, and Wilfried J. Petzny, Berkeley, both of Calif., assignors to Shell Oil Company, New York, N.Y.

Filed Apr. 27, 1970, Ser. No. 31,982
Int. Cl. C10g *1/06*
U.S. Cl. 208—10 **14 Claims**

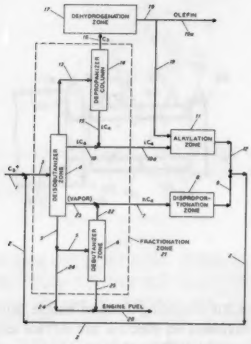


A process for regenerating metal halide catalysts deactivated in hydroconversion of nitrogen-containing feedstocks by the formation of metal halide-ammonium halide complexes is disclosed. Regeneration is effected by contacting the complex with an electron donor solvent for metal halide at conditions at which the solvent effects decomposition of the complex and separation of the resultant metal halide and ammonium halide decomposition products by dissolving the metal halide.

3,657,109
MOTOR FUEL PRODUCTION

Bruce O. Beyaert, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 8, 1969, Ser. No. 864,807
Int. Cl. C10g *39/00*
U.S. Cl. 208—80 **7 Claims**

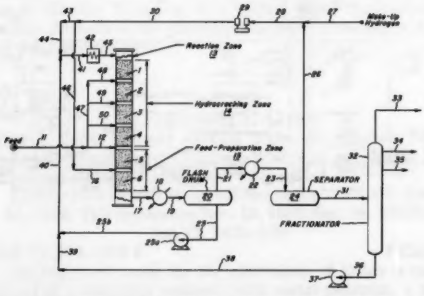


A combination process for obtaining motor fuel from a mixture of hydrocarbons comprising isobutane and normal butane involving alkylation and paraffin disproportionation and preferably also light hydrocarbon dehydrogenation.

3,657,110
PROCESS FOR HYDROCRACKING NITROGEN-CONTAINING FEEDSTOCKS

Robert J. Hengstebeck, Valparaiso, Ind., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of application Ser. No. 546,447, Apr. 29, 1966, now abandoned. This application Jan. 5, 1970, Ser. No. 544
Int. Cl. C10g *23/00*
U.S. Cl. 208—89 **20 Claims**



The process comprises introducing a first portion of a feedstock containing at least 20 parts per million of nitrogen into a feed-preparation zone to reduce the nitrogen and sulfur contents thereof; treating the effluent from the feed-preparation zone to separate a hydrogen-containing light gas and a heavy bottoms fraction from the effluent; introducing the treated effluent into a hydrocracking zone; and introducing a second portion of the feedstock containing at least 20 parts per million of nitrogen into the hydrocracking zone at a plurality of points spaced along the length of the hydrocracking zone to provide an increasing amount of nitrogen along the length of the hydrocracking zone in the direction of flow through the hydrocracking zone. The nitrogen-containing feedstock is introduced into the hydrocracking zone at a plurality of points along its length to control effectively the rate of reaction in the hydrocracking zone. The heat of the controlled hydrocracking reaction is used effectively to reduce external heat supplied to the hydrocarbons prior to their entry into the hydrocracking zone.

3,657,111
SLURRY PROCESS FOR HYDROCARBONACEOUS BLACK OIL CONVERSION

William K. T. Gleim, Island Lake, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 24, 1970, Ser. No. 13,838
Int. Cl. C10g *13/06, 23/06*
U.S. Cl. 208—108 **7 Claims**

A catalytic slurry hydrorefining process of a hydrocarbonaceous charge stock containing hydrocarbon-insoluble asphaltenes is effected by dissolving in the charge stock an oxyvanadate salt having the following structural formula:

$$[N(R)_4]_3VO(X)_5$$

wherein "X" is a cyano, or thiocyano radical, and "R" is hydrogen, or an alkyl group containing up to 10 carbon atoms. The slurry is formed in situ at hydrorefining conditions with hydrogen containing hydrogen sulfide resulting in colloidally dispersed vanadium sulfide.

3,657,112
HYDRODESULFURIZATION OF HEAVY HYDROCARBON OIL WITH HYDROGEN PRESATURATION

William F. Franz, Gardiner, and Howard V. Hess, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 22, 1970, Ser. No. 48,465
Int. Cl. C10g *23/00*
U.S. Cl. 208—211 **6 Claims**

In the hydrogenation of residue-containing hydrocarbon oils, coke formation is suppressed by predissolving hydrogen in the oil at a temperature below 700° F. and carrying out the hydrogenation at a temperature above 700° F.

3,657,113
SEPARATING FLUIDS WITH SELECTIVE MEMBRANES

Arnold F. Stancell, Highland Park, and Arthur T. Spencer, Providence, both of N.J., assignors to Mobile Oil Corporation

Filed Feb. 3, 1970, Ser. No. 8,411
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **17 Claims**

Gaseous or liquid components are concentrated or separated from others differing in molecular size or shape and/or solubility characteristics in homogeneous multicomponent mixtures (e.g., concentrating hydrogen in a hydrogen-methane mixture) by permeation through an ultrathin cross-linked plasma-discharge polymerizate layer of high permselectivity and controlled thickness supported on or bonded to a face of a fluid-permeable substrate. Membranes are prepared by ionizing and polymerizing vaporized monomeric organic compounds (e.g., benzonitrile) at low subatmospheric pressures by a plasma glow discharge which deposits and bonds unbroken cross-linked coatings of about 0.1 to 0.5 micron total thickness onto thicker preformed substrates (e.g., films of polymeric siloxanes or polyphenylene oxide) of adequate strength.

3,657,114

ETHYLENE POLYMERS OF IMPROVED GLASS, TRANSPARENCY & HEAT-SEALABILITY CONTAINING A ZINC SALT OF A FATTY ACID

Vernon J. Smith, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 754,959, Aug. 23, 1968, now abandoned. This application Sept. 25, 1970, Ser. No. 75,675

Int. Cl. C08f *29/02, 45/00*

U.S. Cl. 260—23 H 8 Claims

Ethylene polymers having improved gloss and decreased haze which have incorporated therein from about 20 to about 400 parts per million of a zinc salt of a fatty acid having 7–22 carbon atoms. These polymers exhibit better printability after surface treatment than the same polymers without the fatty acid zinc salt and exhibit better heat sealability than do polymers containing more than the specified amounts of fatty acid zinc salt.

3,657,115

SEMIPERMEABLE MEMBRANES THEIR USE AND METHOD FOR PREPARATION WHEREIN THE MEMBRANES ARE STRETCHED DURING THE INITIAL GELATION PERIOD

Serop Manjikian, and Michael I. Foley, both of Del Mar, Calif., assignors to The United States of America as represented by the Secretary of the Interior

Filed Jan. 27, 1971, Ser. No. 110,157

Int. Cl. B29d *7/24, 27/04;* C08b *3/06*

U.S. Cl. 210—23 4 Claims

Semipermeable membranes are prepared by casting a cellulose ester from a solution of the ester, and subsequently stretching the membrane, during its initial gelation period, in a direction at a right angle to the direction of casting. The resulting membranes exhibit superior selectivity in desalination of water by reverse osmosis.

3,657,116

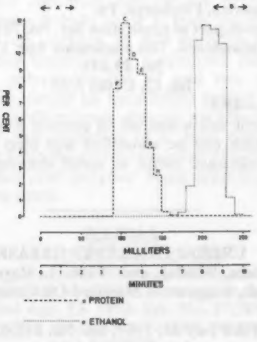
PROCESS FOR THE SEPARATION OF BLOOD COMPONENTS

Wolfgang Haller, 5400 Pooks Hill Road, Bethesda, Md.

Continuation-in-part of application Ser. No. 10,752, Feb. 12, 1970. This application May 5, 1971, Ser. No. 140,329

Int. Cl. B01d *15/08*

U.S. Cl. 210—31 C 3 Claims



A process for separating blood components, wherein an auxiliary substance is added to blood plasma or serum to precipitate fractions thereof. The auxiliary substance-containing fractions are introduced into a chromatographic column filled with a porous solid, and are eluted from the column with an aqueous solvent. The eluant is collected into fractions containing the pure serum or plasma components, free from the auxiliary substance. The porous substance is glass, produced by heat treating, comminuting and leaching with acid and alkali the solidified product of melting together B_2O_3, SiO_2 and RO, wherein R is an alkali metal, alkaline earth metal or heavy metal.

3,657,117

GEL CHROMATOGRAPHY

Klaus Pfitzner, and Friedrich Kraffczyk, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Dec. 22, 1969, Ser. No. 887,365

Claims priority, application Germany, Dec. 21, 1968, P 18 16 380.9

Int. Cl. B01d *17/06*

U.S. Cl. 210—31 43 Claims

Cross-linked polymers suitable for gel chromatography are preferably prepared by pearl polymerization from hydroxyalkyl- or hydroxyalkoxyalkyl-acrylate or methacrylate monomers having up to 5 hydroxyl groups, at least one of which is acyl-substituted. The invention is directed to:

a. the monomers and their preparation;

b. formation of gels from the monomers; and

c. use of the gels for gel chromatography.

3,657,118

PROCESS FOR THE DETERMINATION OF CATECHOLAMINE AND SEROTONIN METABOLITES

Friedrich Kraffczyk, and Roland Helger, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Sept. 9, 1970, Ser. No. 70,929

Claims priority, application Germany, Sept. 9, 1969, P 19 45 471.8

Int. Cl. B01d *15/08*

U.S. Cl. 210—31 19 Claims

Chromatograms of high definition and good separation for the determination of catecholamine and serotonin metabolites in body fluids, e.g., urine, are obtained using as the adsorbent chromatographic grade cellulose impregnated with polyethylenimine. The chromatogram is preferably developed using a multicomponent solvent mixture containing water, a solvent substantially immiscible in water, a solvent miscible with water and the substantially water-immiscible solvent, and an acid, e.g., chloroform/n-butanol/ethanol/glacial acetic acid/water in a 5/55/10/15/15 volume ratio.

3,657,119

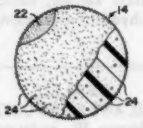
POLLUTION CONTROL DEVICE

Joseph E. Turbeville, 4303 Jetton, Tampa, Fla.

Filed May 22, 1970, Ser. No. 39,848

Int. Cl. C02b *9/02;* E02b *15/04*

U.S. Cl. 210—36 13 Claims



A system for controlling pollution of a body of water which involves the collection, containment and relocation of the

pollutant such as oil from the water surface. Buoyant, water resistant ferromagnetic particles are distributed over the polluted area to adhere to the oil. A magnetic field generated via a magnetic net or parallel series of magnetic grids is then applied to collect the oil coated particles and, if desired, transport them to a more convenient area for disposal.

ERRATUM

For Class 210—40 see:
Patent No. 3,657,125

3,657,120
METHOD OF STABILIZING BROMINE-CONTAINING FIRE EXTINGUISHING HALOGENATED HYDROCARBON COMPOSITION

Peter Porst, Neuruppin, Germany, assignor to VEB Feuerloschgeratewerk Neuruppin, Neuruppin, Germany

Filed Mar. 23, 1970, Ser. No. 22,077
Int. Cl. A62d *1/00*; C23f *11/10*
U.S. Cl. 252—8 **6 Claims**

Bromine-containing halogenated hydrocarbons, especially bromocarbons, bromochlorocarbons, bromofluorocarbons and bromochlorofluorocarbons, are stabilized by incorporating in them 0.05 to 0.15 weight percent of an aromatic polyhydric alcohol of the phenol type (preferably pyrocatechol) and 0.025 to 0.075 percent by weight of an aromatic carboxylic acid (preferably benzoic acid). The stabilized composition is noncorrosive to steel when saturated with moisture, even under high oxygen pressure, and is especially suitable for long-term storage in metal vessels as a fire-extinguishing composition.

3,657,121
PURGE FOR PREVENTING PIPELINE CONTAMINATION

John J. Gannon, Berkeley, and Enver Mehmedbasich, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 1, 1970, Ser. No. 24,802
Int. Cl. C09k *3/00*; E21b *43/28*
U.S. Cl. 252—8.3 **9 Claims**

Surface active contaminants adsorbed on the interior surface of a pipeline can be desorbed therefrom and effectively removed by introducing into the line an effective quantity of wet aliphatic alcohol (C_2–C_4 alcohol) containing a small amount of either a dimer acid of a C_{16}–C_{20} ethenoid fatty acid or a C_4–C_{20} alkyl amine salt of a partially esterified phosphoric acid.

3,657,122
DRILLING FLUID

Mahmoud S. Kablaoui, and Jack H. Kolaian, both of Wappingers Falls, N.Y., assignors to Texaco, Inc., New York, N.Y.

Filed June 16, 1970, Ser. No. 46,805
Int. Cl. C10m *3/14*
U.S. Cl. 252—8.5 C **3 Claims**

An aqueous drilling fluid dispersant and a method of drilling wells using as the drilling fluid dispersant a dihydroxy substituted phenyl alkyl ketone, namely, 1,2-dihydroxy-4-acetylbenzene, 1,2-dihydroxy-4-propionylbenzene, and mixtures thereof.

3,657,123
LUBRICANT COMPOSITIONS

Michael A. Stram, Chicago, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Mar. 23, 1970, Ser. No. 21,993
Int. Cl. C10m *1/28*
U.S. Cl. 252—34.7 **20 Claims**

Water-soluble salts (e.g., alkali metal, ammonium or water-soluble amine salts) of styrene-maleic anhydride copolymer half-esters are employed in aqueous solutions as coolants and lubricants for metal-working operations e.g., metal cutting and abrading. The copolymers are esterified with both a fatty alcohol having from 10 to 22 carbon atoms and a lower alkoxy polyethylene glycol. Metal-working lubricant compositions are also formulated which comprise these salts along with extreme pressure agents such as amine salts of fatty acids and organic phosphate esters. Other additives may also be employed in the lubricating compositions of this invention.

3,657,124
CALCIUM ALKYLPHENOLATE MANUFACTURE

Doris Love, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Sept. 14, 1970, Ser. No. 72,120
Int. Cl. C10m *1/20*; C01m *1/54*
U.S. Cl. 252—42.7 **10 Claims**

Method of preparing a lubricating oil composition of detergent properties containing a calcium salt of alkylphenol comprising introducing into a mixture of an alkoxyalkanol and a member selected from the group consisting of calcium oxide and calcium hydroxide, an oxygen containing gas to form an activated mixture and contacting said activated mixture with an alkylphenol and hydrocarbon oil of lubricating viscosity to form said composition.

3,657,125
COLLECTION OF OILS

Robert L. Strickman, River Vale, N.J., assignor to Strickman Industries, Inc., Orangeburg, N.Y.

Continuation-in-part of application Ser. No. 868,916, Oct. 23, 1969. This application July 15, 1970, Ser. No. 55,243
Int. Cl. C02b *9/02*
U.S. Cl. 210—40 **1 Claim**

Oils, particularly petroleum oils may be removed from water, from beaches and from wildlife, by contacting the oils with a collector comprising granular polyurethane particles substantially devoid of cellular structure. Preferably the collector particles are of a jagged, spiny, cragged nature. When applied to an oil contaminant, the collector particles agglomerate the oil into a gel which can be skimmed or otherwise removed easily.

3,657,126
OIL AND WATER-BASE LUBRICANT: THAT, AS TO IMPROVEMENTS IN OIL AND WATER-BASE LUBRICANTS

David W. Sawyer, Oakmont, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 781,271, Dec. 4, 1968, now abandoned. This application Apr. 17, 1970, Ser. No. 29,641
Int. Cl. C10m *1/26*
U.S. Cl. 252—49.5 **11 Claims**

Use of glycol, tallow and tall oil esters in a mineral oil base lubricant which can be emulsified and used to produce a water-base lubricant useful in metal drawing and ironing operations.

3,657,127
UREIDO THICKENED GREASE

Hubert J. Liehe, Whiting, and Wilbur L. Hayne, Hammond, both of Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed July 25, 1969, Ser. No. 845,028
Int. Cl. C10m *5/20*
U.S. Cl. 252—49.6 **5 Claims**

Certain properties of lubricant greases prepared by thickening a lubricating oil with a thickener prepared by reacting stoichometric amounts of an abietyl amine and a polyisocyanate are improved by incorporating in such lubricant greases an excess of the polyisocyanate.

3,657,128

SYNERGISTIC FUNCTIONAL FLUID COMPOSITIONS

Robert W. Street, Clayton, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of application Ser. No. 739,912, June 17, 1968, now abandoned, which is a continuation of application Ser. No. 497,195, Oct. 18, 1965, now abandoned. This application Aug. 1, 1969, Ser. No. 850,689

Int. Cl. C10m *1/46, 1/30*

U.S. Cl. 252—49.9 16 Claims

Functional fluid compositions comprising at least one halogenated compound, certain phosphate esters and certain bright stock petroleum fractions which have excellent lubricity, fire-resistance, and homogeneity and are particularly useful as lubricants and hydraulic fluids.

3,657,129

LUBRICATING COMPOSITIONS

Frank J. Obermeier, West St. Paul, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed May 5, 1969, Ser. No. 822,030

Int. Cl. C10m *1/20, 1/32*

U.S. Cl. 252—51.5 R 9 Claims

Lubricating compositions which contain significant amounts of chlorinated oils (e.g. paraffin oils which have been chlorinated to more than 40 percent chlorine) are improved for use as metal-working lubricants by the inclusion therein of additive amounts (e.g. 5 weight percent) of one or more ethoxylated fatty amines (e.g. a tertiary amine having one C_{12}-C_{18} fatty alkyl group or radical and 2 polyoxyethylene groups or radicals attached to the amine nitrogen atom). The improved lubricating compositions have a reduced tendency to corrode the metal being worked and are self-emulsifying, thereby permitting the improved lubricating compositions to be removed from the worked metal by aqueous or solvent methods (e.g. water washing).

3,657,130

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

Hazime Machida, Akira Tsurugi, Zenjiro Okuno, and Akinori Mizuno, Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

No Drawing. Filed Feb. 3, 1970, Ser. No. 8,398

Claims priority, application Japan, Feb. 8, 1969, 44/9,536

Int. Cl. G03g *9/04*

U.S. Cl. 252—62.1 3 Claims

A liquid developer for electrophotography comprising a carrier liquid and a toner dispersed in said carrier liquid, said toner consisting substantially of finely-divided particles having a definite color, at least one coating agent as coated on the surfaces of said particles and selected from the group consisting of a synthetic rubber, a natural rubber, polycondensates of said two rubbers and vinyl polymers having an insolubility against said carrier liquid, and a graft-polymer having an affinity with said carrier liquid and consisting of at least one vinyl monomer selected from the group consisting of polymeric vinyl monomers, said graft-polymer being graft-copolymerized to said coating agent.

3,657,131

MAGNETIC GARNETS

Alain Lagrange, Jean Nicolas, and Roland Sroussi, Paris, France, assignors to CSF Thomson, Paris, France

Filed Apr. 13, 1970, Ser. No. 27,769

Claims priority, application France, Apr. 17, 1969, 6911989

Int. Cl. C04b *35/00*

U.S. Cl. 252—62.57 2 Claims

Magnetic materials of garnet structure and having compositions corresponding to the general formula:

$$Y_{3-3x-y}Gd_{3x}Ca_yFe_{5-y}Sn_yO_{12}$$

where

$$0.5 \leqslant x \leqslant 0.85$$
$$0.1 \leqslant y \leqslant 0.5$$

and intended in particular for ultra-high frequency applications.

3,657,132

CABLE OIL HAVING ETHYLENE-PROPYLENE POLYMER DISPERSED THEREIN

Henri Gourlaouen and Marcel Ostyn, Mont Saint Aignan, France, assignors to Esso Research and Engineering Company

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,546

Claims priority, application France, Aug. 28, 1968, 164,442

Int. Cl. H01b *3/22, 7/00*

U.S. Cl. 252—63 8 Claims

The solid material formed during the copolymerization of ethylene and propylene in mol ratio of 6:4 to 3:7 in the presence of a catalyst and solvent, which copolymerization is terminated when the weight ratio of solvent to total dissolved copolymer is from 10:7 to 1:3, is used for thickening insulating oils to render them suitable for use in filled cables.

3,657,133

PRESERVATIVE FOR ELASTOMERS

James R. Miller, Florissant, Mo., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 524,846, Feb. 3, 1966. This application Dec. 27, 1967, Ser. No. 693,759

Int. Cl. C09k *3/00, 3/02*

U.S. Cl. 252—76 5 Claims

Functional fluids not damaging to elastomers, i.e. rubber seals, consist essentially of a major amount of a mineral lubricating oil and a minor amount each of (1) an oil soluble alkaline earth metal salt of a condensation product of an alkyl phenol and an aldehyde and (2) a long-chain aliphatic polar containing compound, i.e. aliphatic alcohols, monocarboxylic acids and polyalkylene glycols.

3,657,134

DEFLOCCULATION OF SOLID MATERIALS IN AQUEOUS MEDIUM

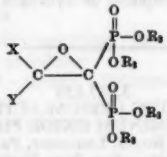
Thomas M. King, St. Louis, and Howard L. Vandersall, Baliwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 13, 1970, Ser. No. 27,980

Int. Cl. C10m *3/38;* B01j *13/00;* C04b *33/12*

U.S. Cl. 252—8.5 C 15 Claims

Epoxy ethane polyphosphonates having the formula



wherein X and Y are hereinafter defined and R is hydrogen or a metal ion, are disclosed as deflocculating agents in aqueous vehicles or systems containing finely divided solid materials such as oil well drilling muds.

3,657,135

PROCESS FOR BINDING OF DUST IN MINES

Hans Lewer, Waldstr. 53, Witten-Annen, Germany; Hanspeter Dust, Deutz Kalkerstr. 66, Cologne-Deutz, Germany; and Martin Thoennes, Farnweg 20, Bergisch Gladbach, Germany

No Drawing. Filed Mar. 13, 1970, Ser. No. 19,514
Claims priority, application Germany, Mar. 26, 1969, P 19 15 333.4
Int. Cl. C09k 3/22
U.S. Cl. 252—88 10 Claims

Process for binding of dust in mines using finely powdered hygroscopic salts which are applied to the surfaces of the galleries and are distinguished by the addition—prior to their application—of 1 to 20% by weight related to the quantity of the hygroscopic salt, of finely distributed water, whereby the final product is to contain 74 to 90% by weight of hygroscopic salt.

3,657,136

METHOD OF CONTROLLING FOAM IN ACRYLONITRILE PRODUCTION

Hillel Lieberman, Andalusia, and John W. Henderson, Philadelphia, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

No Drawing. Continuation-in-part of abandoned application Ser. No. 809,931, Mar. 24, 1969. This application Dec. 29, 1969, Ser. No. 888,813
Int. Cl. B01d
U.S. Cl. 252—321 10 Claims

The present disclosure is directed to a method of defoaming and inhibiting foam formation experienced in acrylonitrile production systems. The method of process generally comprises in its broadest sense, adding to said system a composition comprising at least one hydrocarbon oil, at least one alkaline earth metal hydroxide and at least one fatty acid containing from about 12 to about 22 carbon atoms. The composition may also contain water and a polyether polyol. The composition, of course, is added to said systems in an amount sufficient to control the foam.

3,657,137

NUCLEAR FUEL COMPRISING URANIUM DIOXIDE IN A POROUS CERAMIC OXIDE MATRIX

Thomas J. Burke, Jack Belle, and John C. Clayton, Pittsburgh, Pa., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed June 4, 1964, Ser. No. 374,227
Int. Cl. C09k 1/30
U.S. Cl. 252—301.1 2 Claims

A new ceramic-type nuclear fuel consisting of particles of uranium dioxide embedded in a matrix of zirconium oxide wherein the uranium dioxide particles are partially separated from the matrix by an annular void is prepared by mixing uranium trioxide with calcium-oxide-containing zirconium dioxide powder and a small quantity of a binder, pressing the mixture and firing the mixture in an atmosphere of hydrogen.

3,657,138

VISIBLE-EMITTING CERIUM-ACTIVATED CALCIUM ALUMINUM OXIDE PHOSPHOR

Martin Robert Royce, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 22, 1970, Ser. No. 4,826
Int. Cl. C09k 1/18
U.S. Cl. 252—301.4 R 3 Claims

A phosphor consisting essentially of calcium aluminum oxide activated solely by cerium. The phosphor may be described by the molecular formula $Ca_3Al_2O_6:xCe$, wherein x is in the range of 0.0005 to 0.1 mole. The disclosure includes a cathode-ray tube having a viewing-screen structure comprised of the new phosphor.

3,657,139

PYRENE DERIVATIVES AS OPTICAL BRIGHTENERS

Peter John Brocklehurst and Eric Hemingway, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Nov. 17, 1969, Ser. No. 877,501
Claims priority, application Great Britain, Dec. 10, 1968, 58,662/68
Int. Cl. C09k 1/02
U.S. Cl. 252—301.2 W 6 Claims

Pyrene-1-carboxylic acids and derivatives of these, such as 1-cyanopyrenes and esters and thiolesters of the carboxylic acids, are optical brightening agents for polymeric materials. Particularly effective brightening agents are the cyanoalkyl esters, especially cyanomethyl esters, prepared from salts of the corresponding acids by reaction with chloroalkylcyanides.

3,657,140

CERIUM ACTIVATED SOLID SOLUTION YTTRIUM GALLIUM OXIDE PHOSPHOR

Edward F. Gibbons, 450 Yorkshire Blvd., Dearborn Heights, Mich. 48127; and Douglas E. Smith, 524 3rd St. 48123; and Tseng Y. Tien, 660 Archwood Drive 48103, both of Ann Arbor, Mich.

No Drawing. Filed May 26, 1970, Ser. No. 40,747
Int. Cl. C09k 1/68
U.S. Cl. 252—301.4 R 6 Claims

A solid solution of yttrium aluminum oxide and yttrium gallium oxide with a small amount of cerium ion emits bright yellow light when excited by cathode rays. The phosphor is easily manufactured in the form of a fine uniformly divided powder that has a high resolution and a decay time of less than about 70 nanoseconds.

3,657,141

EUROPIUM-SAMARIUM COACTIVATED STRONTIUM FLUOROBORATE PHOSPHOR

Charles F. Chenot, Towanda, Pa., assignor to Sylvania Electric Products Inc., Seneca Falls, N.J.

Filed Aug. 12, 1970, Ser. No. 63,128
Int. Cl. C09k 1/66
U.S. Cl. 252—301.4 R 9 Claims

A strontium fluoroborate phosphor coactivated by europium and samarium is disclosed wherein the phosphor can be characterized as follows:

$$Sr_wF_xB_yO_z:Eu_uSm_v$$

wherein w is from about 0.90 to about 0.99, x is from about 0.50 to about 1.00, y is from about 3.00 to about 4.50, z is from about 5.00 to about 7.45, u is from about 0.005 to about 0.05, and v is from about 0.005 to about 0.10. The phosphor is useful in low-pressure or high-pressure electric discharge devices.

3,657,142

ZINC SULFIDE PHOSPHORS

Stanley M. Poss, 302 Wilmot Drive, Towanda, Pa. 18848

No Drawing. Continuation of application Ser. No. 812,925, Apr. 2, 1969. This application Apr. 19, 1971, Ser. No. 135,414
Int. Cl. C09k 1/12
U.S. Cl. 252—301.6 S 7 Claims

Zinc sulfide phosphors are disclosed that consist essentially of a major amount of zinc sulfide as the host, from

about 0.001% to about 0.05% by weight of copper and as a co-activator an amount of metal selected from the group consisting of from about 0.01% to about 0.09% by weight of silver and from about 0.004% to about 0.009% by weight of bismuth. A process for producing said phosphors is disclosed that comprises forming a blend of zinc sulfide, copper salts and the foregoing other metal salts, heat treating under controlled temperature and atmospheric conditions and cooling under controlled atmospheric conditions.

3,657,143

MANUFACTURE OF MINUTE CAPSULES, EN MASSE, AND DEWATERING THEIR WALLS

Victor A. Crainich, Jr., Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed Feb. 2, 1970, Ser. No. 7,980

Int. Cl. B01j *13/02;* **B44d** *1/02;* **C08h** *19/02*

U.S. Cl. 252—316 **5 Claims**

A method is disclosed for preparing minute capsules, en masse, in a liquid manufacturing vehicle, said capsules having walls comprising a complex of gelatin and derivatives of sulfosuccinates or organic phosphate esters. Further, as an additional embodiment, a method is disclosed for treating water-swollen gelatin-containing capsule walls with derivatives of sulfosuccinates or organic phosphate esters in order to reduce the water concentration therein.

3,657,144

ENCAPSULATION PROCESS

Noble H. Yoshida, Dayton, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

No Drawing. Filed June 5, 1967, Ser. No. 643,397

Int. Cl. B01j *13/02;* **B44d** *1/02*

U.S. Cl. 252—316 **5 Claims**

A novel method is provided for encapsulating, en masse, in walls of polymeric material, minute solid or liquid particles by a liquid-liquid phase separation technique employing liquid evaporation. Separation of a polymer-rich wall-forming liquid phase from a manufacturing vehicle and subsequent encapsulation of intended capsule core entities dispersed in the vehicle are accomplished by evaporation of a solvent liquid component. Components of the liquid-liquid phase separation process carried on by evaporation include (a) polymeric film-forming material; (b) a suspending liquid which is not a solvent for the polymeric material; and (c) a relatively volatile solvent liquid which is miscible with the suspending liquid and is a solvent for the polymeric material.

3,657,145

DEMULSIFICATION WITH LINEAR POLYMERIC PHOSPHORUS-CONTAINING ESTERS

Franklin E. Mange and Rudolf S. Buriks, St. Louis, and Patrick M. Quinlan, Webster Groves, Mo., assignors to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application Dec. 1, 1967, Ser. No. 687,127, now Patent No. 3,578,731. Divided and this application June 5, 1970, Ser. No. 43,973

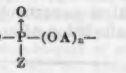
Int. Cl. B01d *17/04*

U.S. Cl. 252—345 **6 Claims**

Linear polyesters of a phosphorus-containing acid and a diol as illustrated by a polyester having repetitive units of the formula:

where X is oxygen or sulfur; B is a diol residue; Z is hydrogen in the case of a phosphite ester i.e. H; a hydrocarbon or a substituted hydrocarbon group in the case of a phosphonate ester i.e. R; an oxyhydrocarbon or a substituted oxyhydrocarbon group in the case of a phosphate ester i.e. —OR; a thiohydrocarbon or a substituted thiohydrocarbon group in the case of a thiophosphate ester i.e. —SR.

The preferred polyester has repeating units of the formula



where OA is the residue of an alkylene oxide or a substituted alkylene oxide; *n* is an integer, for example 1–300 or more, such as about 2–250, for example about 3–200, but advantageously about 5–130, and Z is hydrogen, a substituted group (R), for example, alkyl, aryl, cycloalkyl, alkaryl, aralkyl, heterocyclic, including substituted derivatives thereof, etc.; alkoxy or aryloxy group (OR) for example methoxy, propoxy, isopropoxy, 2-ethylhexoy, etc., phenoxy, etc.

The polyesters are employed as demulsifiers as well as for other uses.

3,657,146

SOAP PRODUCTION

Cornelis Willem Fransen, Utrecht, and Daniel Marten van Kampen, Vlaardingen, Netherlands, assignors to Lever Brothers Company, New York, N.Y.

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,803

Claims priority, application Netherlands, Nov. 3, 1967, 6714945

Int. Cl. C11d *11/00, 13/00*

U.S. Cl. 252—369 **5 Claims**

A process for direct production of a soap of water content not in excess of 25% for household and toilet uses, by saponification at 120–180° C. under 2–10 atm. of a fatty acid, natural or synthetic, using aqueous alkali solution of controlled water content.

3,657,147

NOVEL STANDARDS FOR N.M.R. SPECTROSCOPY

Ludwig Pohl, Frankfurter, and Manfred Eckle, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Filed July 22, 1969, Ser. No. 843,824

Claims priority, application Germany, July 27, 1968, P 17 73 928.5; Aug. 1, 1968, P 17 73 959.2; Mar. 21, 1969, P 19 14 385.2

Int. Cl. C07d *103/02;* **G01n** *27/78, 33/08*

U.S. Cl. 252—408 **10 Claims**

For N.M.R. determinations, there are provided improved standards as follows:

(a) 1,1,3,3,5,5 - hexakis - (trideuteromethyl)-1,3,5-trisila-cyclohexane,

(b) α,α,β,β - tetradeutero - β - (trimethylsilyl) - propionic acid,

(c) α,α,β,β,O - pentadeutero - β - (trimethylsilyl) - propionic acid,

(d) an alkali metal salt of (b),

(e) an alkali metal salt of (c),

(f) β-(trimethylsilyl)-propionic acid, and

(g) an alkali metal salt of (f).

3,657,148
ALKYLATION CATALYST COMPLEX, ITS PREPARATION AND USE
Matthew L. Becker, Philadelphia, and Robert F. Chapman, Lafayette Hills, Pa., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Oct. 23, 1969, Ser. No. 868,920
Int. Cl. C07c *3/56*
U.S. Cl. 252—429 **6 Claims**

Alkylation catalyst complex and its method of preparation by reacting benzene and an alkylate fraction with aluminum chloride in the presence of anhydrous hydrogen chloride. The catalyst is particularly suitable for use in a process for the alkylation of an aromatic hydrocarbon.

3,657,149
CATALYST COMPOSITIONS
Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
No Drawing. Original application Oct. 14, 1968, Ser. No. 767,476. Divided and this application Apr. 17, 1970, Ser. No. 29,660
Int. Cl. C07f *7/22, 5/06*
U.S. Cl. 252—431 R **9 Claims**

Catalyst compositions comprising complex organoaluminate compounds of silicon, tin and phosphorus and a liquid diluent which compositions are particularly useful as epoxide polymerization catalysts are described. These compositions can be prepared by reacting, in a liquid diluent which can be an inert organic diluent or an ether that coordinates with the complex organoaluminate, a lithium organoaluminate with a halogen-containing compound of silicon, tin or phosphorus, as for example by reacting lithium diethylaluminate with dimethyldichlorosilane, stannic chloride, dichlorophenylphosphine oxide, etc., or by reacting a triorganoaluminum such as triethylaluminum with dimethylsilanediol, ortho phosphoric acid, stannic hydroxide, etc.

3,657,150
SOLID CATALYSTS CONTAINING SILICIUM PHOSPHATE, THEIR MANUFACTURE AND USE
Bernard Juguin and Jean Francois Le Page, Rueil-Malmaison, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France
No Drawing. Filed Oct. 27, 1969, Ser. No. 869,860
Claims priority, application France, Oct. 31, 1968, 172,358
Int. Cl. B01j *11/82*
U.S. Cl. 252—435 **13 Claims**

For alkylating or isomerizing mono- or polyolefins, e.g. production of isooctene from butene, there are provided novel catalyst consisting essentially of a silica carrier impregnated with phosphoric acid, the molar ratio of P_2O_5 to SiO_2 being relatively low, between 0.6 and 0.95, and the content of the crystalline C form of silicon phosphate being relatively high, 75–95%. These catalyst which are both highly active and selective are prepared by heating a mixture of silica impregnated with phosphoric acid to 550–1000° C., and then contacting the resultant heated mixture with steam at 100–300° C. For the best mechanical properties of the catalyst, the silica carrier should have an SiO_2 content of 96–99% by weight.

3,657,151
CATALYST MANUFACTURE
Edward D. Noble, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Jan. 15, 1970, Ser. No. 3,239
Int. Cl. B01j *11/40, 11/82*
U.S. Cl. 252—437 **9 Claims**

A process for producing catalysts with larger average pore diameters which comprises (a) forming a hydrogel comprising at least one inorganic oxide, (b) adding a detergent to the hydrogel, and (c) carrying out at least part of the drying of the hydrogel after the detergent is added to the hydrogel. Preferably the detergent is a nonionic high molecular weight detergent composed only of carbon, hydrogen, and oxygen.

3,657,152
CATALYST AND PROCESS FOR THE PREPARATION OF 1,3-CYCLOHEXANEDIAMINES
Moses Cenker, Trenton, and Peter T. Kan, Livonia, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.
No Drawing. Filed May 26, 1969, Ser. No. 827,952
Int. Cl. B01j *11/82*
U.S. Cl. 252—443 **6 Claims**

A process and a catalyst for the preparation of 1,3-cyclohexanediamines are provided. The process comprises hydrogenating 1,3-phenylenediamines in the presence of an alkali-promoted catalyst consisting of cobaltous oxide, calcium oxide, and sodium carbonate at elevated temperature and under moderate pressure to form 1,3-cyclohexanediamines. The aliphatic diamines are useful as intermediates in the preparation of polyurethane, polyurea, polyurethane-polyurea and polyamide coatings, sealants, and elastomers.

3,657,153
PROCESS FOR THE PREPARATION OF A CATALYST FOR THE REFORMING AND AROMATIZATION OF BENZINES
Victor Bucur, Trairan Mircea Filotti, Eugenia Georgescu, Theodora Mazare, Ion Ghejan, Ion Zirna, Elena Lygia Popescu, and Toma Ioszt, Ploiesti, Rumania, assignors to Institutul de Cercetari Pentru Prelucrarea Titeiului, Ploiesti, Rumania
No Drawing. Filed Apr. 1, 1970, Ser. No. 24,847
Claims priority, application Rumania, Apr. 8, 1969, 59,666/69
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 R **2 Claims**

A method of producing a catalyst for the reforming and aromatization of hydrocarbons which comprises reacting alumina containing between 4% and 40% water by hydration with a silicon halide, preferably silicon tetrachloride so that 0.05% to 5% silica is contained in the finished catalyst. Platinum is then deposited upon the silica-containing support.

3,657,154
MICROSPHERICAL ZEOLITIC CRACKING CATALYST
Walter L. Haden, Jr., Metuchen, and Frank J. Dzierzanowski, Somerset, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Woodbridge Township, N.J.
No Drawing. Continuation-in-part of application Ser. No. 416,925, Dec. 8, 1964. This application Sept. 9, 1969, Ser. No. 856,458
The portion of the term of the patent subsequent to Apr. 14, 1987, has been disclaimed
Int. Cl. B01j *11/40*
U.S. Cl. 252—455 Z **3 Claims**

A zeolitic molecular sieve cracking catalyst composition in the form of small, highly attrition-resistant, essentially spherical particles (microspheres) is composed of ion-exchanged synthetic crystalline faujasite and an alkali-leached, alumina-enriched, silica-alumina residue of kaolin clay which had previously been calcined at elevated temperature.

3,657,155

PRODUCTION OF ATTRITION RESISTANT SOLID CATALYSTS CONTAINING ANTIMONY OXIDE SUITABLE FOR USE IN A FLUIDIZED BED REACTION

Takachika Yoshino, Kanagawa, Shigeru Saito, Tokyo, and Yutaka Sasaki and Yoshimi Nakamura, Kanagawa, Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Aug. 5, 1969, Ser. No. 847,731
Claims priority, application Japan, Aug. 5, 1968, 43/54,952
Int. Cl. B01j *11/06, 11/32, 11/40*
U.S. Cl. 252—456 31 Claims

Process for preparing an attrition resistant solid catalyst containing antimony oxide, suitable for use in a fluidized bed essentially comprising the heat treatment of a slurry containing an antimony compound, a ferric compound, a polyvalent metal compound and a silica sol.

3,657,156

COBALT OXIDE CATALYSTS

Cornelius Marthinus Stander, Birchleigh, Kempton Park, Transvaal, Republic of South Africa, assignor to African Explosives and Chemical Industries Limited, Johannesburg, Transvaal, Republic of South Africa

No Drawing. Filed June 23, 1970, Ser. No. 49,194
Claims priority, application Republic of South Africa, July 4, 1969, 69/4,754
Int. Cl. B01j *11/08, 11/22*
U.S. Cl. 252—466 J 10 Claims

A process for making active cobalt oxide containing catalysts as shaped bodies comprising heating a mixture of constituents including a substance from which cobalt oxide can be formed to a first elevated temperature sufficient to produce a binding agent within the mixture, comminuting the resulting material, shaping the material into bodies and heating the shaped bodies at a second elevated temperature for a period of time sufficient to complete the reaction between the constituents.

3,657,157

RANEY NICKEL ACTIVATION USING ACID NEUTRALIZATION AND PRODUCT

William Johan Meindert Pieters, Denville, N.J., John Freel, Oakmont, Pa., and Robert Bernard Anderson, Ancaster, Ontario, Canada, assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed Oct. 21, 1970, Ser. No. 82,833
Int. Cl. B01j *11/22*
U.S. Cl. 252—466 3 Claims

Raney nickel-aluminum alloys are leached with alkali. The leach solution is immediately neutralized by means of titration with an organic acid such as lactic acid. The solution pH is adjusted to between 7.2 and 8.0. The catalyst is removed from the solution and washed with absolute ethanol. The novel Raney nickel catalyst has an increased activity over known Raney nickel catalysts, and was produced in a much shorter time than are known Raney nickel catalysts.

3,657,158

POLYMERIZATION OF EPOXIDES WITH DIHYDROCARBON ZINC PRE-REACTED WITH A POLYHYDRIC PHENOL

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 18,862, Mar. 31, 1960. This application Mar. 25, 1970, Ser. No. 22,690
Int. Cl. C08g *23/06, 23/14*
U.S. Cl. 260—2 7 Claims

Oxiranes are polymerized using as the catalyst the product obtained by reacting a dihydrocarbon zinc compound, such as diethylzinc, with a polyhydric phenol such as resorcinol or pyrogallol, in a molar ratio of polyhydric phenol to zinc compound of from about 0.2:1 to about 1.2:1. Higher molecular weight polymers and/or higher yields of polymers are obtained than when the dihydrocarbon zinc compound is used without pre-reacting it with the polyhydric phenol.

3,657,159

EPOXIDE POLYMERIZATION CATALYSTS COMPRISING COMPLEX ORGANOALUMINATE COMPOUNDS OF SILICON, TIN OR PHOSPHORUS

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Continuation-in-part of abandoned application Ser. No. 767,476, Oct. 14, 1968. This application Aug. 27, 1970, Ser. No. 67,607
Int. Cl. C08g *23/14*
U.S. Cl. 260—2 EP 12 Claims

Complex organoaluminate compounds of silicon, tin and phosphorus which are particularly useful as epoxide polymerization catalysts are described. These compounds can be prepared by reacting a lithium organoaluminate with a halogen-containing compound of silicon, tin or phosphorus, as for example by reacting lithium diethylaluminate with dimethyldichlorosilane, stannic chloride, dichlorophenylphosphine oxide, etc. or by reacting a trialkylaluminum such as triethylaluminum with dimethylsilanediol, methylphosphonic acid, stannic hydroxide, etc.

3,657,160

NON-STAINING RECLAIMS

Allen E. Crepeau, Oxford, Conn., assignor to Uniroyal, Inc., New York, N.Y.

No Drawing. Filed May 4, 1970, Ser. No. 34,620
Int. Cl. C08f *47/24*
U.S. Cl. 260—2.3 5 Claims

This invention deals with a process for reclaiming scrap vulcanized rubber, and particularly with the improvement which comprises heating the scrap at reclaiming temperatures in the presence of an aldehyde or aldehyde donor and in the presence of a resorcinol material.

3,657,161

POLYCARBODIIMIDE-POLYISOCYANURATE FOAM

David L. Bernard and Anthony J. Doheny, Jr., Pittsburgh, Pa., assignors to Baychem Corporation, New York, N.Y.

No Drawing. Filed Oct. 31, 1967, Ser. No. 679,549
Int. Cl. C08g *22/46, 22/34*
U.S. Cl. 260—2.5 AW 8 Claims

Polycarbodiimide polyisocyanurate foams which have improved resistance to burning and which are useful as plastic foam building insulation. From about 3 to about 45% of the total carbodiimide and isocyanurate groups in the foam plastic are preferably carbodiimide groups. The foams are prepared by polymerizing an isocyanate in the presence of a blowing agent, a catalyst which promotes the formation of carbodiimide groups and a catalyst which promotes the formation of isocyanurate groups.

3,657,162

PROCESS OF MAKING EXPANDABLE POLYMERIC STYRENE PARTICLES

Arnold B. Finestone and Michal Niechwiadowicz, Leominster, Mass., assignors to Foster Grant Co., Inc., Leominster, Mass.

No Drawing. Continuation-in-part of application Ser. No. 455,614, May 14, 1965. This application Dec. 6, 1968, Ser. No. 783,175
Int. Cl. C08j *1/26*
U.S. Cl. 260—2.5 B 14 Claims

A process for the manufacture of expandable plastic beads suitable for use in the production of cellular molded

products by aqueous suspension polymerization in which a volatile liquid blowing agent is incorporated into the plastic beads within a short period after a polymer bead stage of 50% and before a polymer bead stage of 80% has been reached and a non-hydrocarbon inert non-condensable gas is added to the reaction chamber prior to absorption of the bulk of the blowing agent by the polymer beads.

3,657,163

EXPANDABLE POLYSTYRENE COMPOSITION FOR INJECTION MOLDING

Hiroshi Kishikawa, Toyonaka-shi, Shintaro Ishikawa, Takatsuki-shi, and Kenji Miyawaki, Ibaraki-shi, Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,405
Claims priority, application Japan, Oct. 19, 1967, 42/67,556
Int. Cl. C08c *17/08;* **C08d** *13/08;* **C08f** *47/10*
U.S. Cl. 260—2.5 E **20 Claims**

An expandable polystyrene composition for injection molding consisting of 50–95 parts by weight of a polystyrene resin and 5–50 parts by weight of an ethylene-propylene copolymer and 0.1–5 parts by weight of a decomposable blowing agent or 0.1–10 parts by weight of a gaseous or liquid blowing agent, based on 100 parts by weight of the sum of both of the resins. Foamed polystyrene moldings produced by injection molding and the foaming of said composition have excellent heat stability.

3,657,164

COPOLYMERS CONTAINING BLOWING AGENTS AND DERIVED FROM ALKENYL AROMATIC AND VINYL POLYSILOXANES AND PROCESS FOR THEIR MANUFACTURE

Horst Jastrow, Frankfurt am Main, and Werner Weber, Mainz, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed May 20, 1969, Ser. No. 826,276
Claims priority, application Germany, May 24, 1968, P 17 70 487.9
Int. Cl. C08f *33/02, 35/02, 47/10*
U.S. Cl. 260—2.5 B **2 Claims**

The invention relates to a process for the manufacture of thermoplastic copolymer beads containing blowing agents, said copolymers being derived from mixtures of from 70% by weight to 99.9% by weight of styrene, from 0% by weight to 30% by weight of acrylonitrile, acrylic- or methacrylic acid esters and from 0.01% by weight to 0.1% by weight of polysiloxanes containing vinyl groups, and to the products of this process used in the manufacture of cellular plastics.

3,657,165

PROCESS FOR PREPARATION OF ETHYLENIC RESIN FOAM

Isamu Kawai, Ageo-shi, Atsuro Nishikawa, Osaka-fu, Osamu Takagi, Kuki-machi, Minami-Saitama-gun, and Akira Iwata and Kohei Sugiyama, Osaka-fu, Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

No Drawing. Filed Oct. 7, 1969, Ser. No. 864,549
Claims priority, application Japan, Oct. 11, 1968, 43/74,489; July 1, 1969, 44/52,314
Int. Cl. C08f *47/10, 29/04*
U.S. Cl. 260—2.5 E **5 Claims**

A process of producing an ethylenic resin foam by mixing and kneading an ethylenic resin with a volatile organic foaming agent under heating and pressure to form a flowable gel and releasing the pressure by extruding out the gel, characterized by the use as said foaming agent of a mixture comprising (A) dichlorodifluoromethane and (B) at least one compound selected from the group consisting of aliphatic hydrocarbons having a boiling point of about 0–70° C. and chlorofluorohydrocarbons having a boiling point of about 0–70° C., said foaming agent having a saturated vapour pressure of less than 25 kg./cm.² at 100° C.

3,657,166

PRODUCTION OF FOAMED THERMOPLASTIC WITH CARBONIZED CELLULAR STRUCTURE

William A. Caldwell, Olathe, Kans., assignor to Phillips Petroleum Company

No Drawing. Filed Oct. 8, 1969, Ser. No. 864,878
Int. Cl. C08f *29/04, 47/10*
U.S. Cl. 260—2.5 HA **5 Claims**

A foamed thermoplastic material with carbonized cellular structure is formed either by mixing a foamable thermoplastic resinous material and a polybasic organic acid and an ammonium salt, or by mixing a foamable thermoplastic resinous material and an ammonium salt of a polybasic organic acid and elevating the temperature to the carbonizing temperature of the organic acid. In a specific embodiment, a mixture of polyethylene and ammonium citrate is raised to the decomposition temperature of the ammonium citrate to produce a foamed polyethylene with fine cellular structure which is colored by the elemental carbon produced in the decomposition reaction.

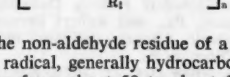
3,657,167

SUGAR DITHIOACETAL POLYDISULFIDES AND PROCESS OF MAKING

Robert Eugene Gramera, Dublin, Calif., assignor to CPC International Inc., Englewood Cliffs, N.J.

No Drawing. Continuation-in-part of application Ser. No. 694,119, Dec. 28, 1967. This application Dec. 10, 1969, Ser. No. 883,999
Int. Cl. C08b *25/00;* **C08g** *1/00*
U.S. Cl. 260—9 **33 Claims**

A polymeric composition comprising sugar dithioacetal polydisulphides having the following structural formula:



where R_1 is the non-aldehyde residue of a sugar, R is an inert divalent radical, generally hydrocarbon, and n is an integer ranging from about 50 to about 1000. Also disclosed is a method of preparing the above composition by reaction of an aldehyde-bearing sugar and a dithiol compound in the presence of a solvent and an oxidant. Also disclosed is the polymerization of dithiol compounds by the same method and a method of preparing sugar polydithioacetals by reaction of a sugar dithioacetal with a dithiol compound in the presence of a Lewis acid catalyst wherein both transdithiolacetalation and polymerization take place.

3,657,168

NONBUBBLING ADHESIVE COMPRISING AN AQUEOUS DISPERSION OF POLYVINYL-ACETATE-THERMOSETTING CROSS-LINKING RESIN AND A CRITICAL AMOUNT OF HYDROXYPROPYL CELLULOSE

Peter Spiros Columbus, Whitestone, N.Y., and Carl Reinhold Erikson, Worthington, Ohio, assignors to Borden, Inc., Columbus, Ohio

No Drawing. Continuation-in-part of application Ser. No. 698,705, Jan. 18, 1968. This application Nov. 23, 1970, Ser. No. 92,207
Int. Cl. C08b *21/32*
U.S. Cl. 260—14 **3 Claims**

The instant invention relates to nonbubbling, heat curable water-based polyvinyl acetate thermosetting resin ad-

hesives comprising, in addition to the resin noted, water-soluble hydroxypropyl cellulose in an amount sufficient to form a nonelastic continuous film on the adhesive surface when exposed to curing temperatures.

3,657,169
STABILIZATION OF METAL CHROMATE PIGMENTS IN WATER-BASED RESINS

Morris Levine, Cleveland Heights, Ralph M. Brane, Bay Village, and Roland W. Hight, Cleveland, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 725,496, Apr. 30, 1968. This application Oct. 22, 1970, Ser. No. 83,252
Int. Cl. C08g *51/04*
U.S. Cl. 260—18 **4 Claims**

Aqueous coating compositions of polycarboxylic acids solubilized with water-soluble alkaline materials and pigmented with metal chromate pigments are stabilized against gelation and seeding by the addition of lead pigment compounds. Metals coated with the compositions are highly resistant to corrosion and the compositions can be coated on to substrates using various methods including dip coating and electrodeposition.

ERRATUM

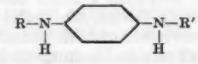
For Class 260—23 H see:
Patent No. 3,657,114

3,657,170
STABILIZATION OF UNVULCANIZED OIL-EXTENDED INTERCONNECTED LINEAR-RUBBERY-POLYMERS

Arthur E. Oberster, North Canton, Ohio, and Ervin E. Schroeder, Lake Charles, La., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Continuation-in-part of application Ser. No. 663,219, Aug. 25, 1967, which is a continuation-in-part of application Ser. No. 611,831, Jan. 26, 1967. This application Mar. 13, 1970, Ser. No. 19,493
Int. Cl. C08d *11/04*
U.S. Cl. 260—23.7 M **4 Claims**

An unvulcanized oil-extended interconnected linear-rubbery-polymer is stabilized by means of a synergistic mixture of (a) a substantial amount of a fatty acid having 12 to 22 carbon atoms per molecule and (b) a substantial amount of a compound having the formula



in which R is a phenyl, tolyl, straight-chain-alkyl, branched-chain-alkyl, cycloalkyl or hydroxy-alkyl group containing 3 to 8 carbon atoms, and R′ is a straight-chain-alkyl, branched-chain-alkyl, cycloalkyl or hydroxy-alkyl group containing 3 to 8 carbon atoms.

3,657,171
HOT MELT COATING COMPOSITION

Dorothy E. White, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

No Drawing. Filed Oct. 8, 1969, Ser. No. 864,877
Int. Cl. C09j *3/26*
U.S. Cl. 260—27 **6 Claims**

Disclosed are hot melt compositions comprised of a hydrocarbon wax, an ethylene/vinyl acetate copolymer, and a metal salt of a carboxylic acid such as sodium benzoate.

3,657,172
SUSPENSION EMULSION CORE-SHELL INTERPOLYMERS CONTAINING VINYL CHLORIDE

Ruth E. Gallagher, Dobbs Ferry, N.Y., and Jesse C. H. Hwa, Stamford, Conn., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 876,928, Nov. 14, 1969. This application Feb. 16, 1970, Ser. No. 11,852
Int. Cl. C08f *15/26*
U.S. Cl. 260—29.6 RB **21 Claims**

Rubber-containing interpolymers are prepared by the suspension polymerization of a vinyl monomer, such as vinyl chloride, in the presence of an aqueous emulsion of particles comprising a hard inner core of a polymer having a glass transition temperature (Tg) above about 25° C. and an outer layer comprising a crosslinkable rubber having a Tg of less than about 25° C. The resulting interpolymer particles are particularly useful as high impact plastics and as modifiers for the reinforcement of relatively rigid types of plastics.

3,657,173
OIL AND WATER REPELLENT COMPOSITIONS

Albert R. Eanzel, Brussels, Belgium, and John Preston, Wiggin, England, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

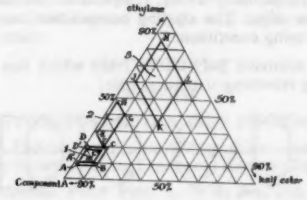
No Drawing. Filed Mar. 3, 1970, Ser. No. 16,253
Int. Cl. C08f *45/24*
U.S. Cl. 260—29.6 F **8 Claims**

A composition which is in the form of an emulsion or which can readily be converted into an emulsion on shaking, suitable for imparting oil and/or water repellency to an article which comprises a fluorine-containing polymer having oil and/or water repellency properties, a major amount of a halogenated solvent which is perchloroethylene, trichloroethylene, 1,1,2-trichloro-1,2,2-trifluoroethane, carbon tetrachloride, methylene chloride, methyl chloroform, monochlorobenzene, ortho-dichlorobenzene, 1,1,2,2-tetrachloro-1,2-difluoroethane or 1,1,1-trichloro-2,2,3,3,3-pentafluoropropane; a minor amount of an alkanol of 1 to 5 carbon atoms, and water.

3,657,174
FILM-FORMING EMULSIONS OF COPOLYMERS

Dietrich Glabisch, Opladen, Herbert Bartl, Cologne-Stammheim, and Heinrich Meckbach, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 12, 1967, Ser. No. 689,957
Claims priority, application Germany, Jan. 7, 1967, F 51,152
Int. Cl. C08f *35/00*
U.S. Cl. 260—29.6 **4 Claims**



Stable aqueous film-forming emulsions containing a copolymer of ethylene, a half ester of an α,β-unsaturated

dicarboxylic acid or a salt thereof, vinyl chloride and vinyl ester in specified proportions useful for coating, impregnating and finishing a variety of substrates.

3,657,175

CARBOXYLIC ACID LATICES PROVIDING UNIQUE THICKENING AND DISPERSING AGENTS

Carl A. Zimmerman, Dover, Del., assignor to Standard Brands Chemical Industries, Inc., Dover, Del.

No Drawing. Filed June 26, 1969, Ser. No. 836,956
Int. Cl. C08f 37/08
U.S. Cl. 260—29.6 T 10 Claims

A latex composition comprising a stable aqueous dispersion of a copolymer prepared in an acid aqueous medium by emulsion polymerization of monomeric material containing from about 20% to about 55% by weight of methacrylic acid, from about 3% to about 35% by weight of an ester of an ethoxylated alcohol, e.g., an ester of maleic anhydride and dinonylphenoxypoly(ethyleneoxy)-ethanol, and a balance comprising at least 35% by weight of styrene, butadiene or mixtures thereof.

Thickening agents having exceptional thickening efficiency and polymeric emulsifiers are prepared from this latex composition by adjusting the composition to an alkaline pH.

3,657,176

STABLE POLYACRYLAMIDE DISPERSIONS

Lanny A. Robbins, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 9, 1970, Ser. No. 27,162
Int. Cl. C08f 29/00
U.S. Cl. 260—29.6 M 3 Claims

Fluid compositions which are resistant to gelling and remain easily dispersible in water during extended storage consist of particulate linear polyacrylamide containing 10–50 percent of acrylate moieties in its molecular structure dispersed in essentially saturated aqueous calcium chloride.

3,657,177

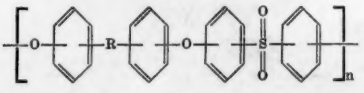
WIRE ENAMEL OF AN AROMATIC POLYSULFONE RESIN AND A HEAT REACTIVE CONDENSATE

Paul L. Adesko, Mount Prospect, Ill., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 25, 1970, Ser. No. 49,945
Int. Cl. C08g 51/26, 51/28, 51/32
U.S. Cl. 260—30.4 R 3 Claims

A coating composition that is resistant to elevated temperatures and can be utilized as a coating for metals, as a wire enamel, as an impregnant for forming circuit boards and as a high temperature adhesive is the subject of this invention. The composition is particularly useful as an over-coat over conventional wire enamels, such as polyimides, polyamides, polyamides-imides, polyesters, polyester-amides, polyesterimides, which are utilized in the winding of motors, generators, electrical coils and the like, these over-coated wires can be fused together to form a particularly strong, temperature resistant bond between the wires. The coating composition contains as the film-forming constituent:

(A) an aromatic polysulfone resin which has the following recurring structural unit:



where R is alkylene radical having 1–4 carbon atoms; and

(B) a heat reactive condensate having terminal —CH_2OH groups.

3,657,178

POLYPIVALOLACTONE FIBERS AND A METHOD FOR THEIR MANUFACTURE

Tohru Kitazawa, Osaka, Hiroshi Maeda, Kobe, and Hideo Yoshidome and Hidehiko Sakata, Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

No Drawing. Original application July 27, 1967, Ser. No. 656,350. Divided and this application June 1, 1970, Ser. No. 54,052
Claims priority, application Japan, July 29, 1966, 41/49,782, 41/49,783, 41/49,784
Int. Cl. C08g 51/50
U.S. Cl. 260—30.6 R 3 Claims

A drawn, tenacious polypivalolactone fiber having a density of 1.17 at the most and a sufficient heat-setting ability which comprises a polymer consisting essentially of polypivalolactone which can be obtained by uniformly incorporating a polymer consisting essentially of polypivalolactone with a small amount of at least one organic compound selected from the group consisting of tricresyl phosphate, trixylenyl phosphate, trinonylphenyl phosphite and trioctadecyl phosphite, extruding the mixture through an orifice of a spinneret, applying high draft to the extruded mixture while it is still in a molten or plasticized state to thereby form undrawn fibers, and thereafter, drawing said undrawn fiber. Said uniform admixture of said compound leads to broadened ranges of the conditions suitable for spinning, improved feasibility of operation, retardation of crystallizing velocity of the polymer after being spun and solidified, and markedly improved orientation.

3,657,179

FLAME RETARDANT ANTIMONY COMPOSITIONS

Paul C. Yates, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 30, 1970, Ser. No. 93,863
Int. Cl. C08k 1/34
U.S. Cl. 260—30.8 DS 21 Claims

Solutions of pentavalent antimony-alpha-hydroxy carboxylic acid compounds or of hydrous pentavalent antimony sols stabilized with an alpha-hydroxy carboxylic acid in polar organic solvents suitable for spinning or casting organic polymers are useful for dispersing flame-retarding pentavalent antimony compounds in polymeric structures.

3,657,180

SLIP AGENTS FOR POLYESTER FILM

Gerald Cohn, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Jan. 8, 1970, Ser. No. 1,569
Int. Cl. C08g 51/36
U.S. Cl. 260—31.8 XA 5 Claims

The process of preparing a linear condensation polyester resin containing therein slip agents comprising the addition of a monovalent metallic compound, or a mixture of a monovalent metallic compound and a divalent metallic compound followed by a dicarboxylic acid slurry to a bis glycol ester and condensing the glycol ester to form a polyester resin that when extruded to film displayed good slip characteristics.

3,657,181

ACOUSTICALLY TRANSPARENT COMPOSITION COMPRISING A THERMOPLASTIC POLYMER AND ORGANIC FLUORINE CONTAINING COMPOUND

Richard G. Riedesel, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,446
Int. Cl. C08f 29/22
U.S. Cl. 260—33.6 F 5 Claims

A material having acoustic transparency useful as a sonar window or lens comprising a homogeneous mixture

of a thermoplastic material and an organic fluorine-containing material. The thermoplastic material has a density not greater than 1.5 and a sound transmission velocity not greater than 2.0×10^5 centimeters per second, but greater than the velocity of sound in water. The organic fluorine-containing material has a density greater than about 1.5 and a velocity of sound transmission less than water. The fluorine-containing material contains not more than 65% by weight of fluorine.

3,657,182

COMPOSITIONS AND A PROCESS FOR PREPARING WATER DISPERSIBLE POLYMERS

Colin S. Jolly, Burlington, Ontario, Canada, assignor to Alchem Limited, Burlington, Ontario, Canada

No Drawing. Filed Jan. 29, 1971, Ser. No. 111,101

Int. Cl. C09d *5/02*

U.S. Cl. 260—33.4 R **14 Claims**

Compositions of finely divided solid, water-soluble, polymers of high molecular weight uniformly coated with a surfactant and mixed with anhydrous sodium sulfate are readily dispersed in water. A method for improving the water dispersibility of a finely divided, solid, water-soluble polymer is disclosed.

3,657,183

STABILIZATION OF POLY(VINYL CHLORIDE)

Joseph Anthony Stretanski, Clinton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 477,321, Aug. 4, 1965. This application Apr. 24, 1969, Ser. No. 819,531

Int. Cl. C08f *45/60*

U.S. Cl. 260—45.8 NZ **4 Claims**

The stabilization of rigid poly(vinyl chloride) by incorporation therein of a stabilizer comprising (a) 0.1 to 10.0% based on the weight of the rigid poly(vinyl chloride) of an alkanolamine or a lower alkylene oxide adduct thereof and (b) 0.1 to 3.0% based on the weight of the rigid poly(vinyl chloride) of an ultraviolet light absorber. In the preferred embodiments, a heat stabilizer is also used.

3,657,184

POLYURETHANE ELASTOMERIC COMPOSITIONS EXHIBITING IMPROVED LIGHT STABILITY

Hiroyuki Segawa, Shozi Kurosaki, and Takuo Kawaguchi, Kurashiki, Japan, assignors to Kuraray Co., Ltd., Osaka, Japan

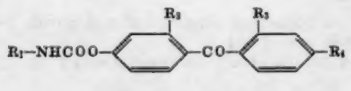
No Drawing. Filed June 11, 1970, Ser. No. 45,551

Claims priority, application Japan, June 27, 1969, 44/51,243

Int. Cl. C08g *51/60*

U.S. Cl. 260—45.85 **8 Claims**

Polyurethane elastomers are stabilized against degradation upon exposure to ultraviolet rays by incorporating therein from 0.1 to about 20% by weight, based on the elastomer, of a benzophenone having the general formula:



wherein R_1 represents an alkyl group having from about 8 to about 20 carbon atoms, R_2 and R_3 each represent a hydroxyl group or hydrogen with the proviso that both R_2 and R_3 are not hydrogen simultaneously, and R_4 represents hydrogen, a halogen such as chlorine or bromine, an alkoxy group having 1 to about 20 carbon atoms, an alkyl group having 1 to about 20 carbon atoms, or a hydroxyl group.

3,657,185

COPOLYMERS OF PHENYLINDAN DICARBOXYLIC ACID AND AN AROMATIC DIHYDROXY COMPOUND

Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Filed Apr. 2, 1970, Ser. No. 25,254

Int. Cl. C08g *17/08, 33/10*

U.S. Cl. 260—47 C **4 Claims**

Polymers containing the esterified residue of phenylindan dicarboxylic acid and an aromatic dihydroxy compound may be solvent cast to provide films, are heat resistant and have useful dielectric properties.

3,657,186

POLYIMINOBENZOXAZINEDIONES AND METHOD OF PREPARATION

James M. Craven, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 26, 1970, Ser. No. 67,230

Int. Cl. C08g *22/06, 22/26, 33/02*

U.S. Cl. 260—47 CB **5 Claims**

A novel polyiminobenzoxazinedione composition which is the reaction product of a multifunctional isocyanate and a multifunctional aromatic o-hydroxynitrile.

3,657,187

THIADIAZOLYLAZO COMPOUNDS

Max A. Weaver and David J. Wallace, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 16, 1969, Ser. No. 833,745

Int. Cl. C09b *29/08;* **D06p** *3/26*

U.S. Cl. 260—158 **8 Claims**

Monoazo compounds having an alkylthio-, alkoxy-, cycloalkylthio-, cycloalkoxy-, arylthio-, or aryloxy-1,3,4-thiadiazolyl diazo component and a m-toluidine coupling component and nitrogen atom of which is substituted by the group $-(CH_2)_n-X$ wherein n is 2 or 3 and X is hydrogen, pyrrolidinono, acylamido, carbamoyl, or alkanoyloxy. The azo compounds are useful for dyeing polyamide materials bright, fast red to pink shades and exhibit excellent fastness to light and improved build-up and migration.

3,657,188

CONTINUOUS PRODUCTION OF RESOLES

Carl C. Perkins, Jr., Prairie Village, Kans., assignor to Butler Manufacturing Company, Kansas City, Mo.

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,860

Int. Cl. C08g *5/06, 5/18*

U.S. Cl. 260—60 **6 Claims**

A new, low viscosity, low water content phenol aldehyde resole and a method of producing the resole continuously

by controlling the temperatures and time of reaction. The time of reaction is controlled by both moving the reactants from one zone to another and by neutralizing prior to removal of excess water.

3,657,189

POLYMERIZATION OF A GASEOUS FORMALDEHYDE

Shinichi Ishida, 22–4, Denenchofu-5-chome, Tokyo, Japan; Norimasa Fujita, 23, Tatemachi, Kanagawa-ku, Yokohama, Japan; Yoshisada Oshima, 14–3–305, Hatanodai-6-chome, Shinagawa-ku, Tokyo, Japan; and Teturo Tanaka, 181, Kamiodanaka; and Mitito Hiruta, 819, Chitose, both of Kawasaki-shi, Japan

Filed Aug. 28, 1970, Ser. No. 67,837

Claims priority, application Japan, Sept. 8, 1969, 44/70,543

Int. Cl. C08g *1/02*

U.S. Cl. 260—67 FP **3 Claims**

Gaseous formaldehyde monomer rapidly polymerizable at a temperature lower than the ceiling temperature of the polymer produced is polymerized in a liquid polymerization medium by blowing the monomer into a liquid polymerization zone through a gas passage heated to a temperature higher than the ceiling temperature of the polymer, and keeping a gas blowing nozzle connecting to the polymerization zone and its neighbor at a temperature higher than the boiling point of the polymerization medium but lower than the thermal decomposition temperature of the monomer.

3,657,190

METHOD FOR FORMING PYRRONE MOLDING POWDERS AND PRODUCTS OF SAID METHOD

Charles T. Hughes, Carlisle, and Robert J. McHenry, Acton, Mass., assignors to Avco Corporation, Cincinnati, Ohio

No Drawing. Filed Nov. 17, 1969, Ser. No. 877,445

Int. Cl. C08g *20/32*

U.S. Cl. 260—65 **7 Claims**

The present invention relates to the formation of improved pyrrone resins of the ladder or semi-ladder structure. The technique involves initial formation of fully cyclized prepolymers having an average degree of polymerization of about 1.5, one with acidic terminal groups, another with amine terminal groups. Thereafter the prepolymers are intimately admixed on a 1:1 stoichiometric basis. The resulting powder mixture is molded at elevated pressures and temperatures to form a fully cyclized resin.

3,657,191

PROCESS FOR THE MODIFICATION OF TERMINAL GROUPS OF POLYESTERS

Rudolf Titzmann, deceased, late of Bobingen, Germany, by Hella Titzmann, nee Hahner, Bobingen, Klaus Titzmann and Jörg Titzmann, Frankfurt am Main, and Michael Titzmann, Munich, heirs, and Hans Thaler, Strassberg, and Josef Walter, Bobingen, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed June 9, 1970, Ser. No. 44,905

Claims priority, application Germany, June 9, 1969, P 19 29 149.7

Int. Cl. C08g *17/14*

U.S. Cl. 260—75 T **4 Claims**

The present invention relates to a process for the manufacture of linear polyesters having an improved stability with respect to compounds with active hydrogen. Polyesters of this type are obtained by reacting polyesters with ethylene carbonates or monofunctional glycidyl ethers. The reaction is first carried out within a temperature range lying 10° to 60° C. below the softening point of the polyester and is then terminated during the melting- and melt-spinning process.

3,657,192

STERICALLY HINDERED SECONDARY DIAMINE CURING AGENTS FOR POLYURETHANE COMPOSITIONS

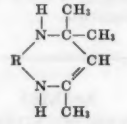
Walter F. Schulz, Joliet, Ill., and Herwart C. Vogt, Grosse Ile, Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

No Drawing. Continuation-in-part of application Ser. No. 699,319, Jan. 22, 1968. This application Aug. 24, 1970, Ser. No. 66,404

Int. Cl. C08g *22/00*

U.S. Cl. 260—77.5 AM **7 Claims**

Sterically hindered heterocyclic secondary diamines prepared by the reaction of mesityl oxide with a vicinal diamine and corresponding to the formula:



wherein R is the alkylene, cycloalkylene or arylene, organic residue of the vicinal diamine are used as chain extender for urethane urea polymers to provide products with improved properties and pot life.

3,657,193

POLYESTERS CONTAINING DIALKYL SUBSTITUTED SULFO-CARBOXYLIC ACIDS

John R. Caldwell, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 24, 1970, Ser. No. 49,511

Int. Cl. C08g *17/04, 17/08*

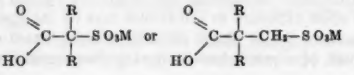
U.S. Cl. 260—76 **7 Claims**

A high thermal stability textile fiber produced from a polymer of

(A) a dicarboxylic acid component consisting essentially of at least 80 mole percent terephthalic acid, or an esterifiable derivative thereof,

(B) a diol component selected from the group consisting of ethylene glycol, 1,4-butanediol, and 1,4-cyclohexanedimethanol, and

(C) from about 1–25 mole percent, based on the total moles of dicarboxylic acid component of a high thermal stability dye improving additive, or an esterifiable derivative thereof, corresponding to the structure



wherein

R is a monovalent alkyl radical having from 1–4 carbon atoms, and

M is an ion of a divalent metal or an alkali metal.

3,657,194

SOLUTION POLYMERIZATION OF LAURYL LACTAM

Michel Biensan, Billere, and Phillipe Bruant, Pau, France, assignors to Société Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed Dec. 23, 1969, Ser. No. 887,556

Claims priority, application France, Dec. 31, 1968, 182,521

Int. Cl. C08g 20/18

U.S. Cl. 260—78 L 10 Claims

A process for the production of a polyamide in the form of a fine powder by heating a stirred solution of a monomeric lactam in an inert solvent containing an anionic polymerization catalyst and an anionic polymerization activator between 70°–150° C. is improved by starting the heating at 70°–95° C. and thereafter increasing the temperature whereat at each level of temperature T the amount *p*% of polymer powder present in the polymerization medium, expressed as a percentage of the total amount of polymer and monomer in the medium, is at least 0.5T—40.

3,657,195

CONTINUOUS PROCESS FOR THE AFTER CONDENSATION OF POLYHEXAMETHYLENE ADIPAMIDE

Helmut Doerfel and Hans Dieter Zettler, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 19, 1969, Ser. No. 800,554

Claims priority, application Germany, Feb. 22, 1968, P 17 20 349.5

Int. Cl. C08g 20/38

U.S. Cl. 260—78 SC 3 Claims

A process for the production of high molecular weight nylon 6,6 by continuous further condensation of low molecular weight nylon 6,6 in a self-cleaning screw extruder reactor provided with at least one degassing orifice at elevated temperature and a pressure of from 50 mm. Hg to 2 atmospheres gauge and while supplying through the screws an amount of energy of from 0.02 to 0.2 kilowatt hours per kilogram of polyamide.

3,657,196

HALF ESTER OF AN EPOXY RESIN AND UNSATURATED DICARBOXYLIC ACID ANHYDRIDE

Newton C. Foster, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original application Oct. 27, 1967, Ser. No. 678,703, now Patent No. 3,557,246, dated Jan. 19, 1971. Divided and this application Aug. 28, 1970, Ser. No. 67,693

Int. Cl. C08g 30/12, 45/04

U.S. Cl. 260—78.4 EP 7 Claims

Compositions of months-long catalyzed pot life at room temperature and hence especially suitable for coating large objects, are made by mixing (a) the product of the uncatalyzed half-esterification of epoxy resin with an olefinically unsaturated dicarboxylic acid anhydride (e.g., maleic anhydride) with (b) a coreactive vinyl monomer (e.g., styrene), (c) a polycarboxylic anhydride containing no olefinic unsaturation (e.g., NADIC methyl anhydride [NMA] viscous liquid methylbicyclo [2.2.1] heptene-2,3-dicarboxylic anhydride isomers) and (d) polymerization catalysts and inhibitors. Upon heating, the composition cures to a thermoset resin. The basic composition is modified with fillers and additives for use as potting compounds, encapsulants, castings, laminate adhesives, etc.

3,657,197

PHOTOSENSITIVE PROPARGYL POLYMER DERIVATIVES

Nathan D. Field, Allentown, and Harlan B. Freyermuth, Easton, Pa., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed May 7, 1970, Ser. No. 35,551

Int. Cl. C08f 27/08

U.S. Cl. 260—78.5 T 3 Claims

A light-sensitive solvent soluble film-forming polymer containing a propargyl group is disclosed. The propargyl group-containing polymers can be used as a photoresist with or without a sensitizer. In another aspect of the disclosure, a sensitizer-stabilizer comprising a xanthen-9-one or a thioxanthen-9-one is disclosed.

3,657,198

PROCESS FOR THE PREPARATION OF AROMATIC POLY-N-ALKYL URETHANES

Kurt Weirauch, Krefeld, Heinrich Krimm, Krefeld-Bockum, Gunther Lenz, Krefeld, and Hermann Schnell, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Sept. 25, 1970, Ser. No. 75,696

Claims priority, application Germany, Sept. 27, 1969, P 19 49 011.0

Int. Cl. C08g 22/04

U.S. Cl. 260—77.5 B 6 Claims

Reaction of substantially equimolar proportions of N,N'-dimethyl-N,N'-dialkyldiaminophenyl compounds with bis-chlorocarbonic acid esters of aromatic dihydroxy compounds at temperatures between about 50 and about 350° C. to produce the title products which are useful as thermoplastic molding materials for producing films and foils.

3,657,199

NOVEL COMPOSITIONS

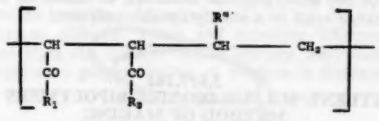
Adnan A. R. Sayigh and Fred A. Stuber, North Haven, and Henri Ulrich, North Branford, Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 829,094, May 29, 1969. This application Nov. 27, 1970, Ser. No. 93,447

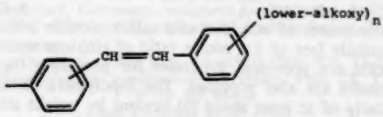
Int. Cl. C08f 27/08, 27/12

U.S. Cl. 260—78.5 T 6 Claims

Light sensitive ester-amide polymers are provided. The polymers are characterized by the recurring unit:



wherein one of R_1 and R_2 represents —O— (lower-alkyl) and the other of R_1 and R_2 represents —NHR wherein R is a stilbene residue having the formula:



n=1 to 3, and R''=lower-alkoxy or phenyl. The polymers have an average molecular weight within the range

of about 100,000 to about 1,250,000. The above ester-amide polymers undergo cross-linking on exposure to ultraviolet light and can be used in photo-resist systems. The above ester-amide polymers are prepared by reacting the appropriate vinyl ether-maleic anhydride or styrene-maleic anhydride copolymer with the appropriate amino-stilbene and esterifying the intermediate amide amine salt with a lower-aliphatic alcohol.

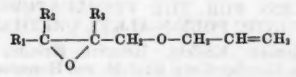
3,657,200

COPOLYMERS OF SULFUR DIOXIDE WITH ALLYL EPOXYALKANE ETHERS

William Ross Moore and Ralph Rolland Langner, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Nov. 4, 1970, Ser. No. 86,940
Int. Cl. C08f *13/06*
U.S. Cl. 260—79.3 A **4 Claims**

Copolymers of sulfur dioxide with compounds of the formula



wherein R_1, R_2 and R_3 are independently hydrogen or methyl groups. These copolymers are useful as permanent sizing agents for natural and synthetic fabrics.

3,657,201

NOVEL ALTERNATING COPOLYMER HAVING SULFONIC ACID GROUP AND A METHOD FOR PRODUCING THEREOF

Kenji Takeya, Yoshihiro Uno, and Akira Yamane, Okayama, Japan, assignors to Sumitomo Chemical Company, Ltd., and Japan Exlan Company Ltd., both of Osaka, Japan

No Drawing. Filed Mar. 24, 1970, Ser. No. 22,367
Claims priority, application Japan, Mar. 26, 1969, 44/23,425
Int. Cl. C08f *13/00*
U.S. Cl. 260—79.3 MU **16 Claims**

An alternating copolymer comprising unsaturated compounds containing a sulfonic acid group (monomer of Group A) and non-substituted or substituted conjugated vinyl compounds (monomer of Group B) is prepared from the monomers of Group A such as vinylsulfonic acids, allylsulfonic acids, styrenesulfonic acids, vinyloxysulfonic acids, and allyloxysulfonic acids and the monomers of Group B such as acrylonitrile, acrylic acid, thioacrylic acid, or their derivatives using an organometallic halide such as organoaluminum halide or organoboron halide or modified catalyst thereof. The product copolymer is useful for shaping a film, fibers, or other molding or for modifying the moldings, or useful as an ion exchange resin or a readily dyeable polymer.

3,657,202

ETHYLENE/SULFUR DIOXIDE BIPOLYMERS AND METHOD OF MAKING

Clarence Frederick Hammer and Thomas Fujio Sashihara, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 28, 1970, Ser. No. 32,741
Int. Cl. C08f *13/06*
U.S. Cl. 260—79.3 A **3 Claims**

Bipolymers of ethylene and sulfur dioxide which are essentially free of 1:1 molar ratio of ethylene and sulfur dioxide are provided. Processes for preparing these bipolymers are also provided. The bipolymers consist essentially of at least about 50 percent by weight ethylene and about 0.1 to 50 percent by weight sulfur dioxide. The absence of 1:1 molar ratio of ethylene and sulfur dioxide are evidenced by the bipolymers having an absorption band at about 16 to 17μ in the infrared spectra and being essentially free of two absorption bands between 13.5 and 14μ in the infrared spectra, respectively. By varying the amount of the highly polar sulfur dioxide in the bipolymers, shaped articles (e.g., molded articles and films) from the bipolymers or from blends of the bipolymers with other solid organic polymers, such as a vinyl chloride polymer, can be flexible or rigid, and possess improved properties of polyethylene.

3,657,203

SYNTHETIC HYDROCARBON ELASTOMERS HAVING IMPROVED BUILDING TACK

Robert Edward Tarney, Hockessin, and John J. Verbanc, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 29,645, Apr. 17, 1970. This application Dec. 11, 1970, Ser. No. 97,319
Int. Cl. C08f *17/00*
U.S. Cl. 260—5 **18 Claims**

Synthetic hydrocarbon elastomers are tackified by uniformly dispersing therein an N,N'-disubstituted-p-arylene diamine, a 1,2-dihydro-2,2,4-trialkyl quinoline, 1,4-di-2,4-cyclopentadien-1-yl-butene or a diester of 5-norbornene-2-methanol and a dicarboxylic acid, and exposing the resulting mixture to a greater than ambient concentration of ozone or to ultraviolet light in the presence of oxygen. Optionally, the elastomer can contain selected resins uniformly dispersed therein which enhance the generation and retention of building tack.

3,657,204

CURABLE AMORPHOUS OLEFINIC TERPOLYMERS FROM ALPHA-OLEFINS AND POLYCYCLIC POLYENES

Sebastiano Cesca, Arnaldo Roggero, and Ermanno Cinelli, San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

No Drawing. Filed Dec. 18, 1969, Ser. No. 886,390
Claims priority, application Italy, Dec. 18, 1968, 25,239/68
Int. Cl. C08f *5/00, 15/40*
U.S. Cl. 260—80.78 **21 Claims**

A new amorphous olefinic terpolymer that is readily curable, and which may be prepared by polymerizing a mixture of two different alpha-olefins having up to ten carbon atoms and a polycyclic polyene represented by the formula A—$(CH_2)_n$—B wherein A is a radical comprising at least one ring having an endomethylene group, B is a cyclodiene radical and n is 0 to 5, is disclosed.

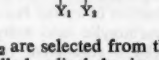
3,657,205

PREPARATION OF HIGH 1,4-POLYPENTADIENES

Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Sept. 3, 1970, Ser. No. 69,468
Int. Cl. C08d *1/14, 3/08, 3/12*
U.S. Cl. 260—82.1 **10 Claims**

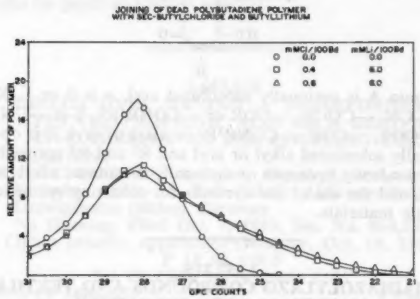
There is disclosed a process for homopolymerizing at least one diolefin of the general formula:



wherein Y_1 and Y_2 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms and R is selected from alkyl (including cycloalkyl), alkaryl, arylalkyl and aryl groups, containing from 1 to 8 carbon atoms, or copolymerizing with at least one diolefin of the general formula

wherein Y_1 and Y_2 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, by contact, under solution polymerization conditions with a catalyst comprising (1) an organoaluminum compound from the class consisting of triorganoaluminum and diorganoaluminum hydride compounds, (2) an organometallic compound, the metal ion of which is selected from the class consisting of metals of Group III–B of the Periodic System.

3,657,206
JOINING DEAD POLYMERS
Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
Continuation-in-part of application Ser. No. 575,967, Aug. 30, 1966. This application Oct. 8, 1969, Ser. No. 864,699
Int. Cl. C08d *5/02, 5/04*
U.S. Cl. 260—85.1 **9 Claims**



Dead polymers, whether liquid or solid, with a molecular weight of 1,000 to 2,000,000, derived at least in part from a diene monomer, are joined with halogenated joining agents to produce a rubber of greater molecular weight.

3,657,207
HOMO- AND COPOLYMERS OF 4-VINYL-AZETIDINONE-2 AND PROCESS FOR THEIR MANUFACTURE
Herbert Bestian, Frankfurt am Main, Eduard Kaiser, Kelkheim, Taunus, and Helmut Korbanka, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Oct. 13, 1969, Ser. No. 865,968
Claims priority, application Germany, Oct. 25, 1968, P 18 05 045.8
Int. Cl. C08f *5/00, 17/00*
U.S. Cl. 260—88.3 L **3 Claims**

Homo- and copolymers of 4-vinyl-azetidinone-2 are provided which are polymerized at the vinyl group in the presence of free radical initiators and carry lateral lactam rings.

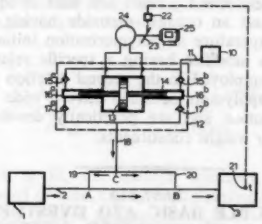
3,657,208
TERNARY CATALYST SYSTEMS FOR THE POLYMERIZATION OF CYCLIC OLEFINS
William Allen Judy, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Continuation of abandoned application Ser. No. 755,375, Aug. 26, 1968. This application Nov. 2, 1970, Ser. No. 86,002
Int. Cl. C08f *1/14, 7/02, 15/04*
U.S. Cl. 260—88.2 R **15 Claims**

A method for the ring opening polymerization of unsaturated alicyclic compounds containing at least four and not more than five carbon atoms in the cyclic ring and unsaturated alicyclic compounds containing at least eight carbon atoms and at least one double bond in the cyclic ring is disclosed, which comprises subjecting such unsaturated alicyclic compounds to a catalyst system comprising (A) at least one transition metal salt from the group of tungsten halides, tungsten oxyhalides, molybdenum halides and molybdenum oxyhalides, (B) at least one organometallic compound wherein the metal is selected from groups I*a*, II*a*, II*b*, IV*a* and V*a* of the Periodic System and (C) at least one Lewis acid of the formula $M—X_n$ where M is a metal from the group of aluminum, zinc, gallium, tin and antimony; X is a halogen and *n* equals the valence of M.

3,657,209
POLYMERIC MATERIAL AND METHOD OF PREPARING SAME
Earl J. Carlson and Samuel E. Horne, Jr., Akron, Ohio, assignors to Goodrich-Gulf Chemicals, Inc., Pittsburgh, Pa.
No Drawing. Filed Apr. 21, 1955, Ser. No. 503,028
Int. Cl. C08d *3/06*
U.S. Cl. 260—94.3 **5 Claims**

This invention is concerned with the polymerization of butadiene in an inert liquid hydrocarbon in the presence of 0.5 to 20% by weight of butadiene of a catalyst comprising $TiCl_4$ and AlR'R''R'''.

3,657,210
PROCESS FOR CONTROLLING THE INTRODUCTION OF INITIATOR IN THE HIGH-PRESSURE POLYMERIZATION OF ETHYLENE
Jan H. K. Minkhorst, Munstergeleen, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands
Filed Aug. 20, 1970, Ser. No. 65,475
Claims priority, application Netherlands, Aug. 25, 1969, 6912911
Int. Cl. C08f *3/04, 1/60*
U.S. Cl. 260—94.9 P **4 Claims**



A process for mixing an initiator solution with ethylene under pressure as it travels to a high pressure polymerizer, where the initiator solution is introduced into the ethylene stream at different points and traveling different distances from the initiator source thereby controlling the high-pressure polymerization of ethylene is disclosed.

3,657,211
CONTINUOUS PRODUCTION OF ETHYLENE HOMOPOLYMERS
Klaus Steigerwald and Oskar Buechner, Ludwigshafen, and Friedrich Urban and Helmut Pfannmueller, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Feb. 11, 1970, Ser. No. 10,586
Claims priority, application Germany, Feb. 22, 1969, P 19 08 964.6
Int. Cl. C08f *3/04, 1/60*
U.S. Cl. 260—94.9 R **4 Claims**

Production of ethylene homopolymers by polymerization of ethylene under the action of organic hydroper-

oxides and oxygen as free-radical-generating polymerization initiators and of polymerization modifiers at elevated temperature and superatmospheric pressure in a tubular reactor having two successive reaction zones, a mixture of ethylene, polymerization initiator and polymerization modifier being introduced continuously at the beginning of each reaction zone. Specific temperature conditions, a hydroperoxide having a specific relatively high half value temperature and a polymerization modifier having a specific relatively high C_s-value are used in the first reaction zone, and specific temperature conditions, oxygen and a polymerization modifier having a specific relatively high C_s-value are employed in the second zone. The ethylene homopolymers obtained have a narrow molecular weight distribution and are practically devoid of very high molecular weight constituents.

3,657,212

CONTINUOUS PRODUCTION OF ETHYLENE HOMOPOLYMERS

Klaus Steigerwald and Oskar Buechner, Ludwigshafen, and Friedrich Urban and Helmut Pfannmueller, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Feb. 11, 1970, Ser. No. 10,588
Claims priority, application Germany, Feb. 22, 1969, P 19 08 963.5
Int. Cl. C08f *1/60, 3/04*
U.S. Cl. 260—94.9 R **3 Claims**

Production of ethylene homopolymers having a specific density by polymerization of ethylene under the action of organic peroxides and oxygen as free-radical-generating polymerization initiators and of polymerization modifiers at elevated temperature and superatomspheric pressure in a tubular reactor having two successive reaction zones, a mixture of ethylene, polymerization initiator and polymerization modifier being introduced continuously at the beginning of each reaction zone. Oxygen as polymerization initiator and a polymerization modifier having a specific relatively low C_s value are used in the first reaction zone, and an organic peroxide having a specific half value temperature as polymerization initiator and a polymerization modifier having a specific relatively low C_s value are employed in the second reaction zone. The ethylene homopolymers obtained have a wide molecular weight distribution and are practically devoid of very high molecular weight constituents.

3,657,213

WATER-SOLUBLE BASIC AZO DYESTUFFS CONTAINING A QUATERNIZED HETEROCYCLIC GROUP BOUND TO THE DYESTUFF THROUGH AN OXYALKYL BRIDGE

Visvanathan Ramanathan, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 648,205, June 23, 1967. This application Mar. 2, 1970, Ser. No. 15,920
Claims priority, application Switzerland, July 4, 1966, 9,650/66
Int. Cl. C09b *31/14, 29/36*
U.S. Cl. 260—156 **5 Claims**

Water-soluble basic dyestuffs which contain a heterocyclic residue, the quaternary ring nitrogen atom of which is bound to an alkyl group belonging to the dyestuff through an oxygen bridging component. The new dyestuffs yield on polyacrylonitrile fibre dyeings with good general fastness-properties. The new dyestuffs produce intense and level dyeings possessing a good fastness, especially a good fastness to washing, perspiration, sublimation, crease-resist finishing, decatizing, hoe-pressing, rubbing, carbonizing, water, sea water, dry cleaning, cross-dyeing and solvents, on these fibres, which may also be dyed in admixture with one another. The new dyestuffs of the invention also display, inter alia, good stability in a wide pH range, good affinity in aqueous solutions of different pH values and a good fastness to kier boiling. Furthermore, the new dyestuffs reserve well on wool and other natural or synthetic polyamide fibres.

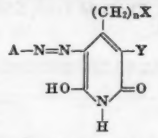
3,657,214

MONOAZO DYESTUFFS CONTAINING A PYRIDYL GROUP

Alistair Howard Berrie and Nigel Hughes, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed June 23, 1969, Ser. No. 835,752
Claims priority, application Great Britain, June 27, 1968, 30,761/68
Int. Cl. C09b *29/36*
U.S. Cl. 260—156 **3 Claims**

Water-insoluble monoazo dyestuffs of the formula:



wherein A is optionally substituted aryl, *n* is 0 or 1, X is —CN, —COOR, —COR or —$CONR^1R^2$, Y is —CN, —COOR, —COR, —$CONR^1R^2$ or alkyl or aryl, R is optionally substituted alkyl or aryl and R^1 and R^2 are each independently hydrogen or optionally substituted alkyl or aryl, and the use of the dyestuffs for colouring synthetic textile materials.

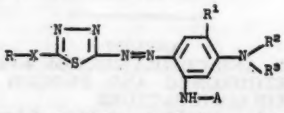
3,657,215

THIADIAZOLYLAZO COMPOUNDS AND TEXTILE MATERIALS DYED THEREWITH

Max A. Weaver and David J. Wallace, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 16, 1969, Ser. No. 833,746
Int. Cl. C09b *29/06;* **D06p** *3/24*
U.S. Cl. 260—158 **8 Claims**

Azo compounds having the formula



wherein R is alkyl, allyl, cycloalkyl or aryl; X is —O— or —S—; A is acyl; R^1 and R^2 each is hydrogen or alkyl; and R^3 is alkyl, are useful as dyes for polyamide textile materials on which the compounds exhibit improved brightness, fastness and migration properties.

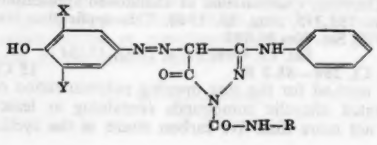
3,657,216

MONOAZO COMPOUNDS CONTAINING A PYRAZOLONE

Brunello Mariani, Milan, Alberto Giuzzi, Ferrania, Savona, and Eugenio Tisselli, Milan, Italy, assignors to Ferrania S.p.A., Milan, Italy

No Drawing. Original application May 3, 1966, Ser. No. 547,189, now Patent No. 3,476,564, dated Nov. 4, 1969. Divided and this application June 9, 1969, Ser. No. 844,705
Int. Cl. C09b *29/38*
U.S. Cl. 260—163 **8 Claims**

A colored azo coupler of the formula



wherein Y is hydrogen, halogen or carboxyl, X is halogen or carboxyl, and R is an aryl radical having at least one water-solubilizing group and at least one group imparting non-diffusivity to the coupler.

3,657,217

MONOAZO DYES CONTAINING AN INDOLE

Heinrich Hiller, Mannheim, and Helmut Pfitzner, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 8, 1969, Ser. No. 856,199
Claims priority, application Germany, Sept. 12, 1968, P 17 94 127.4
Int. Cl. C09b *45/00*
U.S. Cl. 260—165 **2 Claims**

Pigment dyes derived from an orthodicarbonyl compound, a phenylhydrazine ortho-sulfonic acid and a metal salt; they are useful especially for producing printing inks for paper and textile material.

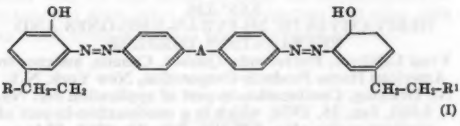
3,657,218

DISAZO DYES HAVING A β-(p-HYDROXYPHENYL)-PROPIONIC ACID OR A DERIVATIVE THEREOF AS THE COUPLING COMPONENT

Gerhard Gnad, Ludwigshafen, Germany, assignor to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

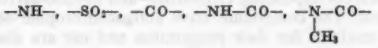
No Drawing. Filed Oct. 7, 1969, Ser. No. 864,532
Claims priority, application Germany, Oct. 19, 1968, P 18 04 070.5
Int. Cl. C09b *35/14*; D06p *1/06*
U.S. Cl. 260—175 **4 Claims**

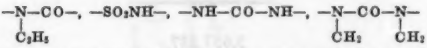
Disazo dyes having a β-(p-hydroxyphenyl)-propionic acid or a derivative thereof as the coupling component; they are useful for dyeing synthetic polyamides or polyesters as fibers and textile materials to give dyeings fast to light and wet treatments and to high temperature, particularly those dyes of the formula:

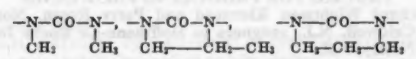


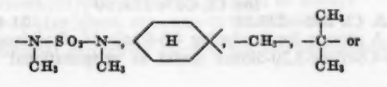
(I)

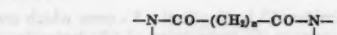
where R and R^1 may be identical or different and each denotes a cyano, carboxyl, carbalkoxy, unsubstituted amide or substituted amide group and —A— denotes a direct bond, an oxygen atom, a sulfur atom, or one of the following bridging groups:











n denoting zero or one of the integers 1 to 6.

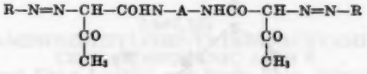
3,657,219

PROCESS FOR THE PREPARATION OF A DIAZO PIGMENT FROM A DIAZOAMINO COMPOUND

Karl Ronco and Willy Mueller, Riehen, Switzerland, assignor to Ciba-Limited, Basel, Switzerland

No Drawing. Filed Sept. 26, 1967, Ser. No. 670,760
Claims priority, application Switzerland, Oct. 5, 1966, 14,364/66
Int. Cl. C09b *27/00*
U.S. Cl. 260—176 **4 Claims**

An improved process for the manufacture of a disazo pigment of the formula



in which A represents an arylene radical and R represents an aryl radical, wherein a diazoamino compound of an arylamine is heated with a bisacetoacetyl-arylenediamine in an organic solvent.

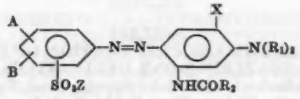
3,657,220

SULFO-CONTAINING PHENYL-AZO-PHENYL DYESTUFF COMPOUNDS

Lindsay Kilmurry, Pennsville, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 31, 1969, Ser. No. 889,677
Int. Cl. C07c *107/06*; C09b *29/06, 29/26*
U.S. Cl. 260—207 **3 Claims**

Orange to red monoazo acid dyes, useful for dyeing synthetic polyamide fibers under neutral to weakly acidic conditions, having the formula



wherein A is H, Cl, methyl, methoxy, NHCOalkyl, NHCOphenyl or NHCOphenyl containing one substituent selected from methyl, methoxy and Cl;

B is H, Cl or methyl;

Z is H or a monovalent alkali metal, ammonium or substituted ammonium cation;

X is H or alkoxy;

R_1 is alkyl; and

R_2 is alkyl, phenyl or phenyl containing one substituent selected from methyl, methoxy and Cl; said alkyl and alkoxy groups containing one to four carbon atoms.

3,657,221

PROCESS FOR PREPARING 9b-SUBSTITUTED-1 - SULFONYL - 1,2,3,9b - TETRAHYDRO-*5H*-IMIDAZO[2,1-a]ISOINDOL-5-ONES

Theodore S. Sulkowski, Wayne, and Scott J. Childress, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

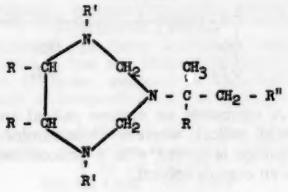
No Drawing. Filed Feb. 19, 1969, Ser. No. 800,754
Int. Cl. C07d *49/30*
U.S. Cl. 260—309.7 **6 Claims**

This invention is concerned with a process for the preparation of 9b-substituted-1-sulfonyl-1,2,3,-9b-tetra-

hydro - 5*H* - imidazo[2,1-a]isodinol - 5 - ones which are useful intermediates in the preparation of dihydroimidazoisoindolols which are pharmacologically active as antidepressants and anorexiants.

3,657,222
PHENETHYL TRIAZEPINE COMPOUND
Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 602,597, Dec. 19, 1966. This application Dec. 17, 1969, Ser. No. 885,967
Int. Cl. C07d *55/54*
U.S. Cl. 260—239 BC **5 Claims**

The present invention is directed to a phenethyl triazepine compound of the formula



In the above and succeeding formulae in the present specification and claims, each R independently represents hydrogen or methyl; R′ represents nitro, alkylsulfonyl, phenylsulfonyl, or substituted phenylsulfonyl; and R″ represents phenyl or substituted phenyl with the proviso that when R′ is nitro, the side chain R is methyl and R″ is other than phenyl. The products of the present invention are useful as agents to control the growth of plants. In addition, these products are useful as agents to modify and control the behavior of warm blooded animals.

3,657,223
PROCESS FOR THE PREPARATION OF BENZODIAZEPIN-2-ONE DERIVATIVES
Joseph Hellerbach and André Szente, Basel, Switzerland, and Armin Walser, West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Jan. 9, 1970, Ser. No. 1,843
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 **10 Claims**

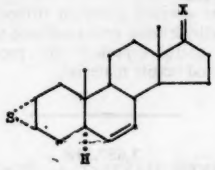
Process for the preparation of benzodiazepin-2-ones comprising effecting ring expansion of the novel 2-oxo-3-aminoquinoline intermediates via acid or heat treatment. The end products are useful as sedatives, tranquilizers, anti-convulsants and muscle relaxants.

3,657,224
METHOD FOR THE PRODUCTION OF PENICILLINS
Leon John Heuser, Robbinsville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.
No Drawing. Continuation-in-part of application Ser. No. 729,535, May 16, 1968, which is a continuation-in-part of application Ser. No. 654,690, July 20, 1967. This application Sept. 10, 1970, Ser. No. 71,226
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **18 Claims**

This invention relates to a new process for the production of penicillin compounds. The process comprises reacting an imine derivative of 6-aminopenicillanic acid or a salt thereof with an acylating agent, such as an acyl halide or acid anhydride, and hydrolyzing the intermediate reaction product to obtain the desired penicillin compound.

3,657,225
2,3-EPITHIO-5α-ANDROST-6-ENE COMPOUNDS
Taichiro Komeno, Osaka-shi, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan
No Drawing. Continuation-in-part of application Ser. No. 769,412, Oct. 21, 1968. This application Dec. 24, 1969, Ser. No. 888,031
Claims priority, application Japan, Oct. 25, 1967, 42/68,682
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.5 **20 Claims**

2α,3α-epithio-17 - oxygenated - 5α - androst-6-ene compounds of the formula



wherein X is an oxo group or a

group, in which R is a hydrogen atom or an optionally substituted lower hydrocarbon-carbonyl group or a substituted or unsubstituted cyclo-lower hydrocarbon group or tetrahydropyranyl group or tetrahydrofuranyl group; R′ is a hydrogen atom or a lower hydrocarbon group, having strong antiestrogenic activity accompanied with least side effects, pharmaceutical preparations containing one or more of them and process for preparation of these compounds.

3,657,226
DERIVATIVES OF 2H-PYRAN-3(6H)-ONES AND PREPARATION THEREOF
Yvon Lefebvre, Pierrefonds, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 5,883, Jan. 26, 1970, which is a continuation-in-part of application Ser. No. 748,196, July 29, 1968. This application Oct. 5, 1970, Ser. No. 78,196
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 R **25 Claims**

There are disclosed herein 24-hydroxy-, 24-acyloxy- and 24 - alkoxy-17β,24-epoxy-21-norcholane 3,20-dione and 17β,24 - epoxy-19,21-dinorcholane-3,20-dione compounds and their corresponding cholanic acid γ-lactones with optional double bonds at positions 4,5 and 22,23 as well as their corresponding 11-hydroxy- and 11-keto-derivatives thereof. The compounds have antigonadotrophic activity and methods for their preparation and use are also disclosed.

3,657,227
PROCESS FOR PRODUCING PREGNANES
Richard Wightman Kierstead and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Dec. 11, 1969, Ser. No. 884,324
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 **21 Claims**

A process for producing 4,6-dihalo-16-alkylidene pregna-4,6-diene-3,20-diones useful as progestational agents

from a 16α,17α-epoxy-3-alkanoyloxy-16-alkyl-pregn-5-en-20-one, and intermediates thereof.

3,657,228
PROCESS FOR THE MANUFACTURE OF 3β-HYDROXY-5β-CARDENOLIDES
Kurt Radscheit, Kelkheim, Taunus, Werner Fritsch, Neuenhain, Taunus, and Werner Haede and Ulrich Stache, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Nov. 12, 1970, Ser. No. 89,098
Claims priority, application Germany, Nov. 14, 1969, P 19 57 264.4
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.57 **1 Claim**

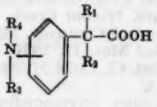
Manufacture of 3β-hydroxy-5β-cardenolides of the 14-dehydro or 14β series by treatment of 3-keto-5β-cardenolides with iridium(IV)-hydrochloric acid, its salts or iridium(III)-chloride in the presence of trialkyl-phosphite.

3,657,229
1,3-DIAZA-2,3-CYCLOALKENE DERIVATIVES
Denis M. Bailey, Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Filed May 2, 1968, Ser. No. 726,212
Int. Cl. C07d *53/02, 51/28, 49/34*
U.S. Cl. 260—239 BC **5 Claims**

2-[α-(lower-alkoxy)benzyl]-2-imidazolines, -1,4,5,6-tetrahydropyrimidines and -4,5,6,7-tetrahydro-1H-1,3-diazepines, having pharmacological properties, e.g., hypoglycemic, diuretic, anti-inflammatory, are prepared by heating a 2-(lower-alkoxy)-2-phenylalkanenitrile with an alkanediamine, wherein 2, 3 or 4 carbon atoms, respectively intervene between the two amino groups, in the presence of a catalytic amount of carbon disulfide or hydrogen sulfide. The intermediate 2-(lower-alkoxy)-2-phenylalkanenitriles are prepared preferably by first reacting a benzaldehyde with a tri-(lower-alkyl) orthoformate to form the aldehyde di-(lower-alkyl) acetal, reacting the latter with an acyl halide to form the corresponding α-halobenzyl lower-alkyl ether and reacting said ether with an alkali cyanide to yield said intermediate nitrile.

3,657,230
α-(TERT. AMINOPHENYL)-ALIPHATIC ACIDS
Richard William James Carney, New Providence, and George de Stevens, Woodland Park, Summit, N.J., assignors to Ciba Corporation, Summit, N.J.
No Drawing. Continuation-in-part of application Ser. No. 716,347, Mar. 27, 1968. This application Sept. 3, 1968, Ser. No. 757,136
Int. Cl. C07d *41/04, 27/02*
U.S. Cl. 260—239 BF **10 Claims**

New α-(tert. aminophenyl)-aliphatic acids, e.g. those of the formula



R_1=H or alkyl
R_2=H, alk(en)yl, cycloalk(en)yl or cycloalk(en)yl-alkyl
R_3=alk(en)yl, hydroxyalkyl or alkoxyalkyl
R_4=cycloalk(en)yl, cycloalk(en)yl-alkyl or aralkyl
R_3+R_4=alk(en)ylene, aza-, oxa- or thia-alkylene

and functional derivatives thereof, are anti-inflammatory agents.

3,657,231
OLIGOMERIC OPTICAL BRIGHTENING COMPOUNDS
Gary E. Booth, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Continuation-in-part of application Ser. No. 763,944, Sept. 30, 1968. This application Mar. 24, 1970, Ser. No. 24,468
Int. Cl. C07d *55/20*
U.S. Cl. 260—240 B **3 Claims**

Oligomeric optical brightening compounds having a molecular weight in the range of 200 to 24,000 and containing from 2–24 fluorescent moieties being separated by inorganic or organic chemical linkages derived from a condensation reaction. The optical brighteners, which are useful in admixture with detergent compositions, are prepared by a reaction between a difunctional fluorescent compound and a difunctional linking compound.

3,657,232
7-[(o-AMINOMETHYLPHENYLTHIO)-ACETAMIDO] CEPHALOSPORANIC ACID
Raymond Urgel Lemieux and Rintje Raap, Edmonton, Alberta, Canada, assignors to R & L Molecular Research Ltd., Edmonton, Alberta, Canada
No Drawing. Filed June 19, 1970, Ser. No. 47,916
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 C **7 Claims**

7-[(o-aminomethylphenylthio)acetamido]cephalosporanic acid and its nontoxic, pharmaceutically acceptable salts are valuable as antibacterial agents, as nutritional supplements in animal feeds and as therapeutic agents in poultry and animals, including man, and are especially useful in the treatment of infectious diseases caused by many Gram-positive and Gram-negative bacteria. 7-[(o-aminomethylphenylthio)acetamido]cephalosporanic acid is prepared, for example, by treatment at 0° C. with trifluoracetic acid of the corresponding compound in which the free amino group is protected with a tert.-butoxycarbonyl group.

3,657,233
10-MORPHOLINO-1,2,3,4-TETRAHYDROBENZO-[b][1,6]NAPHTHYRIDINE DERIVATIVES
Milton Wolf, West Chester, and James L. Diebold, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Application Sept. 16, 1968, Ser. No. 760,063, now Patent No. 3,580,915, which is a continuation-in-part of applications Ser. No. 533,802 and Ser. No. 533,793, both Mar. 14, 1966, and Ser. No. 581,756, Sept. 22, 1966. Divided and this application Apr. 30, 1970, Ser. No. 33,510
Int. Cl. C07d *87/40*
U.S. Cl. 260—247.5 **1 Claim**

This invention concerns 1,2,3,4-tetrahydro-2-methyl-10-morpholino-8-nitro[b][1,6] naphthyridine which is pharmacologically active as a central nervous system depressant.

3,657,234
O-(BENZO-1,2,4-TRIAZIN-3-YL)-PHOSPHORIC, PHOSPHONIC, THIONOPHOSPHORIC AND THIONOPHOSPHONIC ACID ESTERS
Karl-Julius Schmidt, Wuppertal-Vohwinkel, and Ingeborg Hammann, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Oct. 8, 1969, Ser. No. 864,864
Claims priority, application Germany, Oct. 23, 1968, P 18 04 526.6
Int. Cl. C07d *55/10*
U.S. Cl. 260—248 AS **10 Claims**

O-(benzo-1,2,4-triazin-3-yl)-phosphoric, phosphonic, thionophosphoric and thionophosphonic acid esters, i.e.

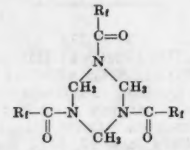
(alkyl, phenyl and O-alkyl)-O-alkyl-O-(mono and di chloro, alkyl and/or alkoxy - substituted benzo-1,2,4-triazin-3-yl)-phosphoric, phosphonic, thionophosphoric and thionophosphonic acid esters, which possess arthropodicidal, especially acaricidal and insecticidal, properties, and which may be produced by conventional methods.

3,657,235
HEXAHYDRO-1,3,5-TRISUBSTITUTED-s-TRIAZINES CONTAINING FLUORINE

Bernard M. Lichstein, Elizabeth, and Robert J. Du Bois, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 17, 1969, Ser. No. 867,370
Int. Cl. C07d *55/14*
U.S. Cl. 260—248 NS **10 Claims**

Novel compounds useful in imparting oil repellency to fabrics have the formula



wherein R_f is a radical containing at least one fluorine atom and from 1 to 20 carbon atoms, the radical being selected from the group consisting of alkyl, phenyl, alkylphenyl, phenylalkyl, and any of these radicals containing an ether linkage. The compounds are prepared by reacting a nitrile of the formula R_fCN with formaldehyde, preferably as trioxane, in the presence of a catalytic amount of a strong acid and preferably also in the presence of a solvent such as carbon tetrachloride.

3,657,236
PRODUCTION OF MELAMINE

Hermann Dieter Fromm, Gruenstadt, Karl Wilhelm Leonhard, Ludwigshafen, Rudolf Mohr, Lampertheim, and Matthias Schwarzmann and Horst Woehrle, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Rhineland-Pfalz, Germany

No Drawing. Filed Nov. 19, 1969, Ser. No. 878,190
Claims priority, application Germany, Dec. 2, 1968, P 18 12 120.5
Int. Cl. C07d *55/28*
U.S. Cl. 260—249.7 A **4 Claims**

To produce melamine, urea and/or its thermal decomposition products are reacted at 220° to 400° C. in contact with an aluminum oxide having a large surface area in the presence of ammonia. The aluminum oxide used has been obtained by treatment of hydroxides of aluminum (which have not been previously calcined) with urea and/or its thermal decomposition products at temperatures of from 150° to 400° C. The advantages of aluminum oxide activated in this manner over aluminum oxide obtained by calcining aluminum hydroxide consist in increased urea conversion and greater attrition resistance.

3,657,237
PROCESS FOR MAKING 1,2,5-THIADIAZOLES IN THE SINISTER CONFIGURATION

Leonard M. Weinstock, Rocky Hill, Roger J. Tull, Metuchen, and Dennis M. Mulvey, Iselin, N.J., assignors to Charles E. Frosst & Co.

No Drawing. Filed Apr. 21, 1969, Ser. No. 818,474
Int. Cl. C07d *87/46*
U.S. Cl. 260—247.1 **4 Claims**

Preparation of S-3-X-4-(3-substituted amino-2-hydroxypropoxy)-1,2,5-thiadiazole beta adrenergic blocking agents using as starting material an optically active alkamine in the sinister configuration, or a derivative of said alkamine, which is reacted with an 3-X-4-chloro (or RO- where R is hydrogen or an alkali metal)-1,2,5-thiadiazole. Novel 3-morpholino-4-chloro (or RO-)-1,2,5-thiadiazoles and novel alkamines and their preparation also are described.

3,657,238
3-MORPHOLINOALKYL-2,1-BENZOISOTHIAZOLINES

Joseph A. Skorcz, Milwaukee, and John T. Suh and Claude I. Judd, Mequon, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 571,967, Aug. 12, 1966, and Ser. No. 682,974, Nov. 14, 1967, now Patent No. 3,528,989. This application Apr. 27, 1970, Ser. No. 32,461
Int. Cl. C07d *87/46*
U.S. Cl. 260—247.1 **2 Claims**

The compounds are 2,1-benzisothiazolines substituted in the 3-position which are useful pharmaceutical agents, especially central nervous system stimulants and antihypertensive agents. Compounds disclosed include 1,3-dimethyl-3-(3'-morpholinopropyl) - 2,1 - benzisothiazoline-2,2-dioxide and 1-3-dimethyl-3-(3'-N-methylpiperazinopropyl)-2,1-benzisothiazoline-2,2-dioxide.

3,657,239
OCTAHYDROPYRIDAZINO[1,2-a]PYRIDAZINES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Original application July 14, 1967, Ser. No. 653,351. Divided and this application Feb. 2, 1970, Ser. No. 7,995
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 A **10 Claims**

2-substituted aryl - 1,6 - diazabicyclo[4.4.1]undecanes, e.g., 2-phenyl-1,6-diazabicyclo[4.4.1]undecane, are prepared from the N_5-methyl halide salts of 1-substituted aryl - 1,2,3,4,6,7,8,9 - octahydropyridazino[1,2-a]pyridazines and are useful as central nervous system stimulants.

3,657,240
PROCESS FOR THE PREPARATION OF TETRAHYDROPYRIMIDOISOINDOLOLS

Theodore S. Sulkowski, Wayne, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 487,587, Sept. 15, 1965, Ser. No. 576,833, Sept. 2, 1966, Ser. No. 622,929, Mar. 14, 1967, Ser. No. 723,587, Apr. 23, 1968, and Ser. No. 757,775, Sept. 5, 1968. This application Oct. 24, 1969, Ser. No. 869,327
Int. Cl. C07d *51/46*
U.S. Cl. 260—251 A **13 Claims**

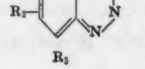
This invention is concerned with the process of reacting 2,3,4,6 - tetrahydropyrimido[2,1 - a]isoindol - 6 - one with lithium compounds to prepare tetrahydropyrimidoisoindolols which are pharmacologically active as antidepressant and diuretic agents.

3,657,241
SUBSTITUTED CINNOLINE COMPOUNDS

Norman H. Kurihara, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 12, 1970, Ser. No. 19,127
Int. Cl. C07d *51/08*
U.S. Cl. 260—250 A **11 Claims**

Substituted cinnolines corresponding to the formula



where R is —CN or —$CONH_2$, X is —Cl or —Br, R_1 is —H, —Cl, —Br, —F or $-C_nH_{2n}+1$, n being an integer of from 1 to about 4, and R_2 and R_3 independently are —H or —Cl. The compounds are suitable for use as fungicides, herbicides and insecticides.

3,657,242

2,6-SUBSTITUTED - 4,5 - DIHYDROPYRIDAZIN(2H)-3-ONES AND 1,3-SUBSTITUTED HEXAHYDROPYRIDAZINES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 702,157, Jan. 16, 1968, which is a continuation-in-part of application Ser. No. 680,002, Nov. 2, 1967, which in turn is a continuation-in-part of abandoned application Ser. No. 566,719, July 21, 1966. This application Mar. 17, 1970, Ser. No. 20,434

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 23 Claims

2-(ω-hydroxyalkyl)-6-aryl or heterocyclic substituted-4,5-dihydropyridazin(2H)-3-ones or 1-(ω-hydroxyalkyl)-3-aryl or heterocyclic substituted-hexahydropyridazines, e.g., 2-(4-hydroxybutyl) - 6 - (2-thienyl)-4,5-dihydropyridazin(2H)-3-one or 1-(4-hydroxybutyl)-3-(2-thenyl)hexahydropyridazine, are prepared by condensing ω-hydrazinoalkanols with aryl or heterocyclic-γ-ketobutyric acids and are useful as anti-inflammatories.

3,657,243

PYRIDAZONE COMPOUNDS AND PROCESS FOR THEIR PRODUCTION

Juan Miquel Quintilla, Calle Viladomat 71, Barcelona, Spain

No Drawing. Filed June 20, 1969, Ser. No. 835,215

Claims priority, application Spain, June 27, 1968, 355,900

Int. Cl. C07d *51/04*

U.S. Cl. 260—250 A 11 Claims

Certain 6-substituted α-(3-pyridazon - 2 - yl) aliphatic acids, salts and in particular substituted amides are disclosed, and processes for their manufacture.

The substituted amide compounds include those having valuable anti-inflammatory action in humans and animals, especially when they are optically active. (—)N-methyl - N - (2-phenylisopropyl)2-2(6 phenyl-3-pyridazonyl) acetamide is particularly mentioned.

3,657,244

1-(2',3',4'-TRISUBSTITUTED PHENYL)-2-AMINO-ALKANOLS-(1) AND SALTS THEREOF

Anton Mentrup, Kurt Schromm, Karl Zeile, and Otto Thoma, Ingelheim (Rhine), Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim (Rhine), Germany

No Drawing. Filed Oct. 16, 1967, Ser. No. 713,265

Claims priority, application Germany, Oct. 18, 1966, B 89,417; Oct. 20, 1966, B 89,476; Nov. 29, 1966, B 90,062

(Fled under Rule 47(a) and 35 U.S.C. 116)

Int. Cl. C07c *93/14, 93/26*

U.S. Cl. 260—256 4 Claims

The compounds are 1-(2',3',4'-trisubstituted-phenyl)-2-amino-alkanols-(1) and acid addition salts thereof, useful as sympathomimetics in warm-blooded animals.

3,657,245

CERTAIN 5H,8H-THIAZOLO[3,2-a]PYRROLO[2,3-d] PYRIMIDIN-5-ONES

Gerhard Bormann, Basel, and Franz Troxler, Bottmingen, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

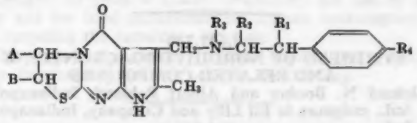
No Drawing. Filed Aug. 20, 1970, Ser. No. 65,726

Claims priority, application Switzerland, Aug. 29, 1969, 13,143/69

Int. Cl. C07d *99/06*

U.S. Cl. 260—256.5 R 8 Claims

The present invention concerns new compounds of the formula:



wherein A and B together form a single bond, or A is ethoxy or hydroxymethyl and B is hydrogen, R_1 is hydrogen or hydroxy, R_2 is hydrogen or methyl, R_3 is methyl, or R_3 is hydrogen when R_2 is methyl, and R_4 is hydrogen, methoxy or chlorine.

The compounds are useful in the prophylaxis of thrombosis and embolism and for improving microcirculation.

3,657,246

2-AMINO-7-SUBSTITUTED PYRIDO[2,3-d] PYRIMIDINE COMPOUNDS

Robert F. Meyer, Ann Arbor, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed July 22, 1969, Ser. No. 843,773

Int. Cl. C07d *51/46*

U.S. Cl. 260—256.4 F 2 Claims

2-amino-7-substituted-(and optionally 6,7-disubstituted)-pyrido[2,3-d]pyrimidine compounds; and acid-addition salts. Substitution at position 6 includes methyl, methoxy, or phenoxy. Substitution at position 7 includes phenyl, substituted phenyl, thienyl, or pyridyl. 6,7-disubstitution can also include a fused ring. The compounds are pharmacological agents, especially diuretic agents producing increased urinary excretion of water and sodium. They can be produced by reacting 2,4-diamino-5-pyrimidinecarboxaldehyde with a ketone in the presence of a base.

3,657,247

PESTICIDAL HALOGEN-SUBSTITUTED PYRIMIDINYL PHOSPHORUS ESTERS

Peter Frank Hilary Freeman, Earley, Roger Franklin Joseph Markey, Woodley, Frederick Charles Peacock, Ascot, and Stuart Peter Sharpe, Maidenhead, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Filed July 7, 1969, Ser. No. 839,686

Claims priority, application Great Britain, Aug. 7, 1968, 37,720/68

Int. Cl. C07d *51/36*

U.S. Cl. 260—256.5 R 4 Claims

Halogen-substituted pyrimidinyl phosphorus esters which are useful as pesticides.

3,657,248

CONDITIONING PROCESS FOR PRODUCING BETA PHASE QUINACRIDONE

Anthony P. Wagener, Park Forest, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

No Drawing. Continuation-in-part of application Ser. No. 658,663, Aug. 7, 1967, now Patent No. 3,547,926. This application Aug. 27, 1970, Ser. No. 67,564

Int. Cl. C07d *39/00*

U.S. Cl. 260—279 R 10 Claims

This invention comprises a process for "conditioning" quinacridone to produce the beta-phase by milling the

quinacridone with an inorganic salt such as sodium chloride, at a temperature in the range of 100–175° C., preferably 100–150° C., in the presence of a non-solvent liquid. This beta-phase is violet in color and has a characteristic X-ray diffraction pattern distinguishing it from other forms of the quinacridone. The conditioning process of this invention can be applied even to quinacridone of the other phases to produce the beta-phase. The conversion to the beta phase by grinding at these temperatures can be effected even in the presence of solvents, such as dimethylformamide, which have been reported as effecting the formation of a gamma phase quinacridone.

3,657,249
SYNTHESIS OF NORDIHYDROACRONYCINE AND RELATED COMPOUNDS

Richard N. Booher and Albert Pohland, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 653,651, July 17, 1967. This application Oct. 12, 1970, Ser. No. 80,240

Int. Cl. C07d *37/00*

U.S. Cl. 260—279 R **4 Claims**

Nordihydroacronycine and related compounds are prepared by the reaction of a 1,3-dihydroxy-9-acridone with 1-chloro-3-methyl-2-butene in the presence of a Lewis acid catalyst. Nordihydroacronycine is a useful intermediate in the synthesis of acronycine, an anti-tumor agent.

3,657,250
BENZOCYCLOHEPTAISOQUINOLINE DERIVATIVES

Francois T. Bruderlein, Montreal, Quebec, and Leslie G. Humber, Dollard des Ormeaux, Quebec, Canada, assignors to Ayerst, McKenna and Harrison Limited, Ville St. Laurent, Quebec, Canada

No Drawing. Filed Feb. 10, 1970, Ser. No. 10,306

Int. Cl. C07d *39/00*

U.S. Cl. 260—286 Q **3 Claims**

Octahydrobenzo[6,7]cyclohepta[1,2,3-d,e]pyrido- (or pyrrolo) [2,1-a]isoquinolines, optionally substituted on the piperidine or pyrrolidine ring with lower alkyl. The compounds are useful CNS depressants, anticonvulsant and antiinflammatory agents, and methods for their preparation and use are also disclosed.

3,657,251
AMINE OXIDE PREPARATION

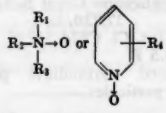
Richard D. Smetana, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

No Drawing. Filed Mar. 18, 1969, Ser. No. 808,350

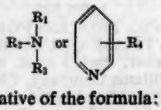
Int. Cl. C07d *31/24*

U.S. Cl. 260—290 P **7 Claims**

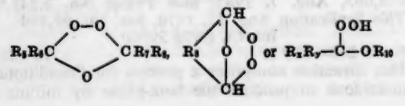
Method of preparing tertiary amine oxide of the formula:



comprising contacting a tertiary amine of the formula:



with an ozone derivative of the formula:



in the presence of a molybdenum, tungsten or vanadium oxide-forming catalyst where R_1, R_2, R_3 are alkyl, aryl, alkylaryl and arylalkyl, R_4 is hydrogen or alkyl; R_5, R_6, R_7, R_8, R_X, R_Y are hydrogen, alkyl, aryl, alkylaryl and arylalkyl, R_9 is α, Ω alkylene and R_{10} is alkyl or acyl.

3,657,252
3-PHENYL - 8-BENZOFURANYLALKYL DERIVATIVES OF NORTROPINE AND NOTROPIDINE

Carl Kaiser, Haddon Heights, N.J., and Charles L. Zirkle, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Original application Oct. 25, 1968, Ser. No. 770,799, now Patent No. 3,546,232, dated Dec. 8, 1970. Divided and this application July 17, 1970, Ser. No. 62,771

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 **8 Claims**

3-phenyl-8-thianaphthenylalkyl or -8-benzofuranylalkyl derivatives of nortropine and nortropidine in which either or both the phenyl and benzoheterocyclic moieties may be substituted by chloro, bromo, fluoro, trifluoromethyl, methyl or methoxy as well as the corresponding lower alkanoyl nortropine esters have neuroleptic activity. The compounds are generally prepared by condensation of a 3-phenylnortropine with an active derivative of the benzoheterocyclic alkanoic acid, such as the acid halide, to give an amide intermediate which is reduced to the 8-substituted alkyl nortropine product. Dehydration of the latter with acid gives the corresponding nortropidine whereas acylation with an appropriate acyl derivative gives the corresponding nortropine ester.

3,657,253
3-ARYLOXY-8-CARBAMOYLNORTROPANES

Grover Cleveland Helsley and Robert Frederick Boswell, Jr., Richmond, Va., assignors to A. H. Robins Company Incorporated, Richmond, Va.

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,593

Int. Cl. C07d *43/06*

U.S. Cl. 260—292 **11 Claims**

3α-aryloxy-8-carbamoylnortropanes and 3β - aryloxy-8-carbamoylnortropanes which are prepared from the precursor 3α-aryloxynortropanes and 3β-ayloxynortropanes are described. The procedures whereby the precursor are prepared with retention of isomeric configuration are described. The novel compounds have anticonvulsant properties.

3,657,254
3,6-DIMETHYL-1,2,3,4,4a,9a-HEXAHYDRO-γ-CARBOLINE DIHYDROCHLORIDE

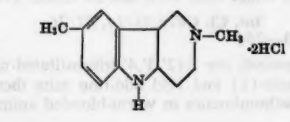
Nikolai Konstantinovich Barkov, Belyaevo-Bogorodskoe, kvartal 46–47, korpus 40, kv. 160; Natalya Fedorovna Kucherova, Petroverigsky pereulok 3, kv. 21; Nikolai Konstantinovich Kochetkov, Leninsky prospekt 13, kv. 129; Izida Grigorievna Zhukova, Konkovo-Derevlevo, 6 mikroraion, korpus 27, kv. 78; and Nina Mikhailovna Sharkova, 3 Donskoi proezd 5, kv. 22, all of Moscow, U.S.S.R.

No Drawing. Filed Oct. 31, 1969, Ser. No. 873,096

Int. Cl. C07d *39/00*

U.S. Cl. 260—293.55 **1 Claim**

3,6 - dimethyl - 1,2,3,4,4a,9a - hexahydro - γ - carboline dihydrochloride of the formula



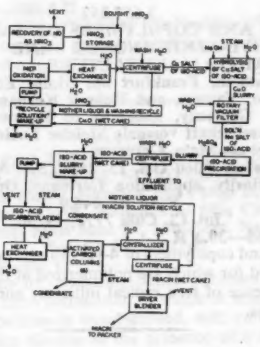
a method of producing said compounds including the steps of reducing 3,6-dimethyl-1,2,3,4-tetrahydro-γ-carboline hydrochloride in an aqueous-acidic medium at a temperature of up to 100° C., with subsequent alkalization of the reaction mixture, separation of the resulting base which is 3,6-dimethyl-1,2,3,4,4a,9a-hexahydro-γ-carboline, treating it with hydrogen chloride, and isolarion of the target product; a medicinal preparation, comprising said compound as an active principle.

3,657,255

CONTINUOUS PROCESS FOR PRODUCTION OF ISOCINCHOMERONIC ACID AND NICOTINIC ACID

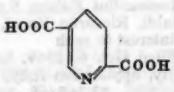
Souren Zacharia Avedikian, 34 Athens Road, Short Hills, N.J. 07078

Filed May 28, 1970, Ser. No. 41,586
Int. Cl. C07d *31/36*
U.S. Cl. 260—295.5 R **8 Claims**

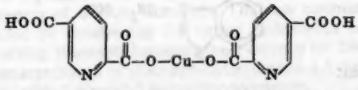


This invention relates to a novel and improved continuous process for the production of

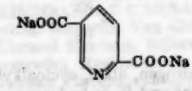
Isocinchomeronic acid, hereinafter referred to as "ISO-ACID,"



by continuously hydrolyzing at an elevated temperature in an aqueous medium an insoluble metal salt of "ISO-ACID," such as copper isocinchomeronate, hereafter referred to as "Cu Salt of ISO-ACID,"

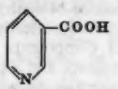


with an alkaline material, such as sodium hydroxide, to give in solution a soluble metal salt of "ISO-ACID," such as sodium isocinchomeronate, hereinafter referred to as "Na Salt of ISO-ACID,"



and an insoluble metal oxide, such as CuO, separating the solution from the solid oxide, which is then recycled, and adding to the solution an acid, such as sulfuric acid, to precipitate "ISO-ACID" and separating the "ISO-ACID" and washing it; and

Nicotinic acid, hereinafter referred to as "NIACIN"



by continuously decarboxylating "ISO-ACID" in an aqueous slurry at elevated temperature and pressure, to yield a solution of "NIACIN," evaporating said solution to dryness to yield "NIACIN" having a purity suitable for use in animal feed supplements or treating said solution by decolorization and crystallization and drying of the "NIACIN" to yield a U.S.P. "NIACIN" for use as a drug and for food enrichment for human consumption, and recycling the remaining solution.

The steps of the instantly claimed process are graphically illustrated by the flow sheet in the drawing.

3,657,256

DIPYRIDYLIUM QUATERNARY DIHALIDE HALOGEN COMPLEXES

Robert M. Thomas, Fred R. Gerns, and John L. Sands, West Lafayette, Ind., assignors to Great Lakes Chemical Corporation, West Lafayette, Ind.

No Drawing. Continuation-in-part of application Ser. No. 770,082, Oct. 23, 1968. This application Jan. 15, 1971, Ser. No. 106,935
Int. Cl. C07d *3/42*
U.S. Cl. 260—296 D **9 Claims**

Halogen complexes of dipyridylium quaternary dihalides which are bacteriocidal and herbicidal agents and useful as defoliants and desiccants, particularly as cotton defoliant-desiccants.

3,657,257

3-ARYL-8-CARBAMOYL NORTROPANES

Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed Aug. 31, 1970, Ser. No. 68,592
Int. Cl. C07d *43/06*
U.S. Cl. 260—292 **8 Claims**

3α-aryl-8-carbamoyl nortropanes and 3β-aryl-8-carbamoyl nortropanes are described which are prepared by reacting the precursor 3α-arylnortropanes and 3β-arylnortropanes with nitrourea and isocyanates. Methods are disclosed whereby the precursor 3α-arylnortropanes and 3β-arylnortropanes can be prepared. The compounds have anticonvulsant properties.

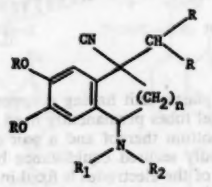
3,657,258

AMINOBENZYLCYCLOALKYLNITRILES

Hans-Joerg Treiber, Bruehl, and Frank Zimmermann, Mannheim, Germany, assignors to Knoll A.G. Chemische Fabriken, Ludwigshafen (Rhine), Germany

No Drawing. Filed Sept. 16, 1969, Ser. No. 858,513
Claims priority, application Germany, Sept. 25, 1968, P 17 93 488.2
Int. Cl. C07d *29/32*
U.S. Cl. 260—293.62 **17 Claims**

Aminobenzylcycloalkylnitriles of the general formula



wherein R is lower alkyl; *n* is 1 or 2; R_1 is hydrogen or lower alkyl and R_2 is straight or branched chain alkyl, cycloalkyl, aralkyl or halo, alkoxy, benzyloxy or trifluoromethyl substituted cycloalkyl or aralkyl or taken together

with the N atom R_1 and R_2 are pyrrolidinyl, piperidino, morpholino, piperazino, or N-methylpiperazino, their acid addition salts and pharmaceutically acceptable compositions containing said compounds. The compounds are blood pressure depressants and exhibit spasmolytic and anti-inflammatory properties as well as cardiac activity, such as dilation of coronary vessels and hence are useful in the treatment of hypertension, anginal seizures and related ailments.

3,657,259
PROCESS FOR THE PRODUCTION OF PYRIDINE CARBOXYLIC ACIDS

August Stocker, Othmar Marti, Theodul Pfammatter, and Gerhart Schreiner, Visp, Switzerland, assignors to Lonza Ltd., Gampel, Valais, Direction: Basel, Switzerland

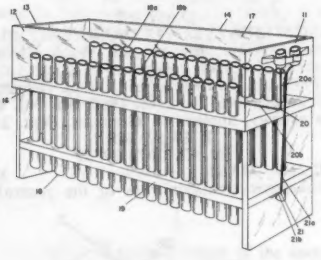
No Drawing. Filed Oct. 28, 1969, Ser. No. 871,951
Claims priority, application Switzerland, Nov. 8, 1968, 16,688/68; Feb. 24, 1969, 2,732/69; June 6, 1969, 8,622/69; Aug. 1, 1969, 11,759/69; Sept. 19, 1969, 14,168/69
Int. Cl. C07d *31/36*
U.S. Cl. 260—295 R **17 Claims**

Nicotinic acid and other carboxylic acids having a pyridine nucleus may be prepared by the oxidation of alkyl pyridine and compounds in the presence of 25–600% excess nitric acid at temperatures of 180–370° C. with pressures of 20–500 atm. The nitric acid concentration of the reaction mixture is adjusted to 10–28% to precipitate as crystalline hydronitrate and separated from the mixture. The pH of an aqueous solution of the pyridine carboxylic acid hydronitrate is adjusted with the basic starting material to the isoelectric point of the specific pyridine carboxylic acid to precipitate the same. The crystalline precipitation is separated and the mother liquors are combined and recycled as the starting material after adjustment of the concentrations therein.

3,657,260
ELECTROPHORESIS APPARATUS

Robert C. McLeester, 1202 Pontiac Trail, Madison, Wis. 53711

Filed Sept. 25, 1970, Ser. No. 75,366
Int. Cl. B01k *5/00*
U.S. Cl. 204—299 **5 Claims**



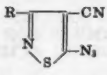
An acrylic plastic unit having a upper buffer chamber with upright gel tubes permanently fixed in and extending through the bottom thereof and a pair of platinum wire electrodes fixedly secured equidistance between the rows of tubes. One of the electrodes is fixed in the upper chamber above the bottom thereof and the other below the bottom. A rubber covered stopper plate is releasably attached to the unit for simultaneously sealing the lower end of all of the gel tubes.

3,657,261
AZIDOISOTHIAZOLES

Alfred Joos and Walter Wirtz, Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

No Drawing. Filed Jan. 27, 1970, Ser. No. 6,317
Claims priority, application Germany, Jan. 29, 1969, P 19 04 241.2
Int. Cl. C07d *91/12*
U.S. Cl. 260—302 S **22 Claims**

Azidoisothiazoles of the formula



wherein R is halogen or SR_1, SOR_1 or SO_2R_1 in which R_1 is alkyl or benzyl or phenethyl unsubstituted or substituted with NO_2 and/or halogen are insect repellents and also have antibacterial and antimycotic activity.

3,657,262
HOMO- AND COPOLYMERS OF 4 - VINYL-4-METHYL-AZETIDINONE-2 AND PROCESS FOR THEIR MANUFACTURE

Herbert Bestian, Frankfurt am Main, Eduard Kaiser, Kelkheim, Taunus, and Helmut Korbanka, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Oct. 13, 1969, Ser. No. 865,970
Claims priority, application Germany, Oct. 25, 1968, P 18 05 046.9
Int. Cl. C08f *7/12, 19/00*
U.S. Cl. 260—30.3 R **5 Claims**

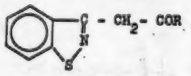
Homo- and copolymers of 4-vinyl-4-methyl-azetidinone-are provided for which are polymerized at the vinyl group in the presence of free radical initiators and carry lateral lactam rings.

3,657,263
CERTAIN BENZISOTHIAZOLE-ACETIC ACID DERIVATIVES

Tullo Vitali, Parma, Pietro Scrivani, Milan, Riccardo Ponci, Pavia, Giovanni Pellegrini, Milan, Franco Gialdi, Pavia, and Emilio Arsura, San Donato, Milan, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy, and Franco Gialdi, Riccardo Ponci, and Tullo Vitali, fractional part interest to each

No Drawing. Filed Oct. 6, 1969, Ser. No. 866,089
Claims priority, application Italy, Oct. 7, 1968, 22,169/68
Int. Cl. C07d *91/12*
U.S. Cl. 260—304 **25 Claims**

Benzoisothiazol derivatives having the formula:



wherein:

R is either OY wherein Y is hydrogen,
a metal, ammonium,
or a straight- or branched-chain alkyl;
or R is

wherein R_1 is hydrogen, alkyl, cycloalkyl or a nucleus of the phenyl series and R_2 is hydrogen, alkyl, cycloalkyl, amino or a nucleus of the phenyl series,

are useful as herbicides.

The foregoing compound may be prepared by reacting 3-chloro-4,5 benzoisothiazol dissolved in an anhydrous

organic solvent (e.g., anhydrous ethanol) with a carbanion generating substance (e.g., diethylmalonate in presence of sodium ethoxide) while maintaining this mixture at its boiling point for several hours, thus obtaining the corresponding esters (e.g., 4,5-benzoisothiazol-3-ethylacetate). From the esters, other compounds within the foregoing general formula may be prepared by conventional prior art methods.

3,657,264

HETEROCYCLICALLY SUBSTITUTED THIADIAZOLES

Dietrich Rucker and Carl Metzger, Wuppertal-Elberfeld, and Ludwig Eue, Cologne, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,836
Claims priority, application Germany, Mar. 4, 1969, P 19 10 895.3
Int. Cl. C07d *91/62, 99/10*
U.S. Cl. 260—306.8 D 6 Claims

Heterocyclically substituted thiadiazoles, which possess herbicidal properties, and which may be produced by conventional methods.

3,657,265

PROCESS FOR PREPARING BENZOXAZOLONES FROM AROMATIC NITRO COMPOUNDS

Ehrenfried H. Kober, Hamden, and Philip D. Hammond, North Haven, Conn., assignors to Olin Corporation

No Drawing. Filed June 21, 1968, Ser. No. 738,791
Int. Cl. C07d *85/48*
U.S. Cl. 260—307 C 14 Claims

The process for preparing benzoxazolones by reacting an aromatic nitro compound, in which at least one of the two ortho positions is unsubstituted, with carbon monoxide and carbon dioxide in the presence of a catalyst and recovering the benzoxazolones produced thereby.

The catalyst may be a mixture of a halide or an oxide of palladium or rhodium with an oxide of an element selected from the group consisting of vanadium, molybdenum, tungsten, niobium, chromium and tantalum.

3,657,266

v-TRIAZOLYLCOUMARINS

Rudolf Kirchmayr, Binningen, Basel-Land, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Sept. 2, 1970, Ser. No. 69,148
Int. Cl. C07d *99/04, 99/06;* C09k *1/02*
U.S. Cl. 260—308 A 8 Claims

New 3-phenyl-7-v-triazolylcoumarins are used as optical brighteners of organic materials. The new coumarins are prepared by condensing the oxime hydrazones obtained by reacting thionaphthenequinone-2-oximes or 2-isonitrosocoumaranones-3 or thionaphthenequinone-1,1-dioxide-2-oximes with 3-phenyl-7-hydrazinocoumarins.

3,657,267

BENZIMIDAZOLE CARBAMATES

Josephus Ludovicus Hubertus Van Gelder, Beerse, Leopold Frans Corneel Roevens, Rijkevorsel, and Alfons Herman Margaretha Raeymaekers, Beerse, Belgium, assignors to Janssen Pharmaceutica, N.V.

No Drawing. Filed June 20, 1969, Ser. No. 835,246
Int. Cl. C07d *49/38*
U.S. Cl. 260—309.2 16 Claims

Compounds of the class of alkyl esters of N - [5(6)-acyl - 2 - benzimidazolyl]carbamic acid having anthelmintic utility.

3,657,268

PROCESSES FOR IMIDAZO[2,1-a]ISOINDOLES

George A. Cooke, Denville, Harry A. Dugger, Morristown, and William J. Houlihan, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Jan. 29, 1970, Ser. No. 6,958
Int. Cl. C07d *49/34*
U.S. Cl. 260—309.6 7 Claims

5-substituted - 5 - hydroxy-2,3-dihydro-5H-imidazo[2,1-a]isoindoles, e.g., 5 - (4-chlorophenyl)-2,3-dihydro-5-hydroxy-5H-imidazo[2,1-a]isoindole, are prepared by oxidizing corresponding imidazo[2,1-a]isoindoles. These compounds are useful as appetite depressants and psychic energizers.

3,657,269

IMIDAZO[2,1-a]ISOINDOLES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 825,954, May 19, 1969. This application Oct. 9, 1969, Ser. No. 865,179
Int. Cl. C07d *49/36*
U.S. Cl. 260—309.6 6 Claims

Imidazo[2,1-a]isoindoles useful as anorexics and psychic-energizers are prepared from the N,o-dilithium derivative of 2-phenylimidazoline by various routes.

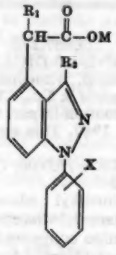
3,657,270

1-PHENYL-1H-INDAZOLE-4-ACETIC ACIDS

Franklin W. Short, Saline, and Milton L. Hoefle, Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

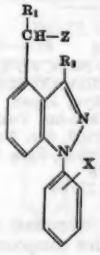
No Drawing. Continuation-in-part of application Ser. No. 717,448, Mar. 29, 1968. This application Jan. 16, 1970, Ser. No. 3,505
Int. Cl. C07d *49/18*
U.S. Cl. 260—310 C 10 Claims

Novel indazole acetic acids (I)

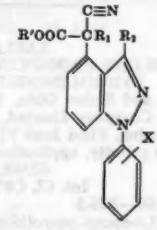


I

having pharmacological activity and being particularly useful as anti-inflammatory agents for the prevention and treatment of inflammation, are provided by hydrolyzing indazoleacetic acid compounds (II) or by hydrolyzing and decarboxylating α-cyanoesters (III)



II



III

where R_1 and R_2 individually represent hydrogen or methyl, R' is lower alkyl, M is hydrogen or a cation, X is hydrogen, methyl, fluoro or chloro, and Z is a carbon-linked group hydrolyzable to a carboxyl group.

3,657,271
1,3-DIMETHYL-5-METHYLAMINO-8-PHENYL-PYRAZOLO[4,3-e][1,4]DIAZEPINE
Leo Ralph Swett, Waukegan, Ill., assignor to Abbott Laboratories, Chicago, Ill.
No Drawing. Filed June 22, 1970, Ser. No. 48,480
Int. Cl. C07d *57/02*
U.S. Cl. 260—310 R **3 Claims**

1,3-dimethyl-5-methylamino - 8 - phenylpyrazolo[4,3-e][1,4]diazepine and its method of preparation. The compound exhibits anti-inflammatory activity.

3,657,272
PROCESS FOR PREPARING X-FORM METAL-FREE PHTHALOCYANINE
Paul J. Brach, Rochester, and Hugh A. Six, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.
No Drawing. Continuation-in-part of application Ser. No. 755,441, Aug. 6, 1968. This application Dec. 21, 1970, Ser. No. 100,552
Int. Cl. C09b *47/04*
U.S. Cl. 260—314.5 **12 Claims**

A process of preparing X-form metal-free phthalocyanine comprising the steps of mixing phthalonitrile in an ammonia-saturated alkylalkanolamine solvent, seeding the mixture with a catalytic amount of X-form phthalocyanine, heating said mixture to reflux temperature and maintaining said temperature for about 20 to about 70 minutes, and filtering the hot reaction product formed thereby is disclosed.

3,657,273
ADAMANTANE-1,3-DICARBOXAMIDES
Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Continuation-in-part of application Ser. No. 631,121, Apr. 17, 1967. This application May 1, 1970, Ser. No. 33,956
Int. Cl. C07c *103/00;* **C07d** *27/04*
U.S. Cl. 260—326.3 **5 Claims**

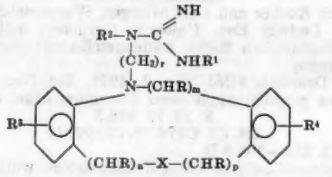
N,N' - dialkylaminoalkyl adamantane - 1,3-dicarboxamides and adamantane-1,3-diacetamides and also the corresponding cyclic amino compounds are described herein. They are anti-bacterial, anti - fungal, anti - algal, anti-protozoal, and anti-inflammatory agents. They also show activity as analgesics and anti-hypertensives. The compounds are prepared by the reaction of adamantane-1,3-dicarbonyl chloride or adamantane-1,3-diacetyl chloride with aminoalkylamines.

3,657,274
PROCESS FOR PRODUCING N-ACYL 3,4-EPOXY-PYRROLIDINE DERIVATIVES
Eiji Ohki and Sadao Oida, Tokyo, Japan, assignors to Sankyo Company Limited, Chuo-ku, Tokyo, Japan
No Drawing. Filed June 11, 1969, Ser. No. 832,470
Claims priority, application Japan, June 12, 1968, 43/40,378
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.3 **2 Claims**

N-acyl-3,4-epoxy pyrrolidine compounds are prepared by oxidation of N-acyl-3-pyrroline compounds with pertrifluoroacetic acid.

3,657,275
DIBENZOOXAZEPINES AND DIBENZO-THIAZEPINES
Harry L. Yale and Jack Bernstein, New Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.
No Drawing. Continuation-in-part of application Ser. No. 551,560, May 20, 1966. This application Mar. 9, 1970, Ser. No. 17,972
Int. Cl. A61k *27/00;* **C07d** *87/54, 89/20*
U.S. Cl. 260—327 B **1 Claim**

Therapeutically active compounds utilizable as ataractic agents and as sedatives and hypotensive agents having the formula



wherein R, R^1 and R^2 are hydrogen, lower alkyl, phenyl or phenyl-lower alkyl; R^3 and R^4 are hydrogen, halogen, lower alkyl, trifluoromethyl, or lower alkoxy; X is oxygen or sulfur, *r* is 2 to 5; *m* is 0 or 1; *n* and *p* are each 0, 1 or 2; provided that the sum of $m+n+p$ being from 1 to 3, and that when *m* equals 1 and *n* and *p* are each 0, X is sulfur.

3,657,276
DIBENZO (c,f) THIAZEPINE (1,2) COMPOUNDS
Charles Malen, Fresnes, and Michel Laubie, Vaucresson, France, assignors to Science Union et Cie Societe Francaise de Recherche Medicale, Suresnes, France
No Drawing. Filed Dec. 13, 1967, Ser. No. 690,091
Claims priority, application Great Britain, Dec. 19, 1966, 56,720/66
Int. Cl. C07d *93/42*
U.S. Cl. 260—327 B **3 Claims**

Dibenzo (c,f) thiazepines (1,2) wherein the two benzene nuclei may be substituted by halogen or lower-alkyl or lower-alkoxy having up to 5 carbon atoms inclusive, the nitrogen atom is substituted by lower-alkyl having up to 5 carbon atoms inclusive, and the thiazepine bears in position 5 an optionally substituted piperazine radical or an oxy- or thio-alkyleneamino radical, and acid addition salts thereof, having hypotensive, bronchodilator and diuretic activity.

3,657,277
SUBSTITUTED 1,3-DIOXOLANES
Lars-Olof Ryrfors, Perstorp, Sweden, assignor to Perstorp AB, Perstorp, Sweden
No Drawing. Filed Sept. 16, 1970, Ser. No. 72,808
Claims priority, application Sweden, Oct. 2, 1969, 13,610/69
Int. Cl. C07d *13/04*
U.S. Cl. 260—340.9 **1 Claim**

A new compound is disclosed which is 4-ethoxycarbonyl-1,3-dioxolane having the following formula:

It is useful in making polymers.

3,657,278
PROCESS FOR THE PREPARATION OF ROSE OXIDE

Dieter Böse and Karlheinz Pfoertner, Basel, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.

No Drawing. Original application Aug. 8, 1968, Ser. No. 751,070. Divided and this application June 29, 1970, Ser. No. 60,177
Int. Cl. C07d 7/14
U.S. Cl. 260—345.1 4 Claims

An improved process for preparing the known, olfactorily-desirable Rose Oxide by pyrolyzing the novel 3-chloro-2,6-dimethyl-1-octen-8-ol, is disclosed, as well as a method for preparing the novel starting material.

3,657,279
PROCESS OF MONOESTERIFICATION OF DICARBOXYLIC ACIDS

Hideo Higashi, 15–4, 3-chome Takaban, and Kotaro Morinaga, 11–7, 1-chome Gakuenmachi Kurume-cho, both of Tokyo, Japan

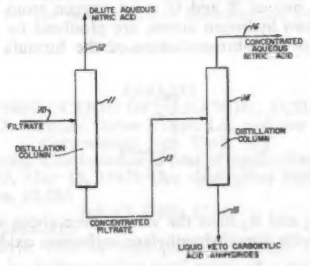
No Drawing. Filed May 14, 1970, Ser. No. 37,327
Claims priority, application Japan, May 21, 1969, 44/39,427
Int. Cl. C07d 7/22; C07c 69/40, 69/60
U.S. Cl. 260—345.5 1 Claim

A process for producing monoesters of dicarboxylic acids or the metal salt additives thereof characterized by reacting higher alcohols, cyclic alcohols or substances that contain the mentioned compounds with dicarboxylic acid anhydrides in the presence of a metal trihalide in the amount that is required for the esterification reaction.

3,657,280
PROCESS FOR PRODUCING A KETO POLYCARBOXYLIC ANHYDRIDE AND RECOVERY THEREOF BY PLURAL STAGE DISTILLATION

Henri K. Lese, Monroeville, and Rex W. Smyth, Gibsonia, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed May 8, 1970, Ser. No. 35,680
Int. Cl. B01d 3/14; C07c 61/36
U.S. Cl. 260—346.4 2 Claims



A filtrate obtained from the nitric acid oxidation of 1,1 - bis(3,4 - dialkylphenyl)alkanes and containing nitric acid, water and keto polycarboxylic acids is separated into at least three fractions, the first consisting essentially of an aqueous solution containing up to about 10 percent by weight of nitric acid, the second consisting essentially of an aqueous solution containing from about 20 to about 65 percent by weight of nitric acid, and the third containing liquid keto polycarboxylic acids in dehydrated form.

3,657,281
4-ARYL-1-DIBENZOFURAN-ALKANOIC ACIDS AND SALTS THEREOF

Franklin W. Short, Saline, Mich., assignor to Parke, Davis & Company, Detroit, Mich.

No Drawing. Filed Dec. 31, 1969, Ser. No. 889,744
Int. Cl. C07d 5/44
U.S. Cl. 260—346.2 3 Claims

4-phenyl-1-dibenzofuranacetic acid, 4-(o-fluorophenyl)-1-dibenzofuranacetic acid, 4-(o-chlorophenyl)-1-dibenzofuranacetic acid, α-methyl derivatives, and carboxylate salts. The compounds are anti-inflammatory agents useful in relieving or preventing inflammation. They can be produced from the corresponding α-cyano lower alkyl esters by hydrolysis and accompanying decarboxylation of one of the two resulting carboxyl or carboxylate groups.

3,657,282
CARBOXYEPOXYETHYL-1-PHOSPHONIC ACID AND DERIVATIVES

Burton G. Christensen, Scotch Plains, Thomas R. Beattie, North Plainfield, and Donald W. Graham, Menlo Park, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Jan. 23, 1969, Ser. No. 793,590
Int. Cl. C07f 9/38
U.S. Cl. 260—348 A 4 Claims

Novel substituted epoxyethylphosphonic acids and derivatives thereof are prepared by oxidation of the corresponding vinyl compounds or by treating a 1,2-disubstituted ethylphosphonic acid compound with a reagent capable of effecting epoxide ring closure. The new substituted epoxyethylphosphonic acid compounds and derivatives such as their salts are antibacterials which inhibit the growth of gram-positive and gram-negative bacteria.

3,657,283
MANUFACTURE OF BZ-1-BZ-1'-DIBENZANTHRONYL SULFIDES

Helmut Schmidt and Alfred Schuhmacher, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,882
Claims priority, application Germany, Mar. 5, 1969, P 19 11 086.2
Int. Cl. C09b 3/12
U.S. Cl. 260—363 3 Claims

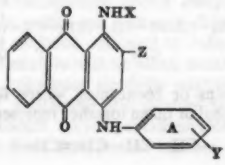
Production of Bz-1-Bz-1'-dibenzanthronyl sulfides from halogen-substituted Bz-1-benzanthrones characterized by the use of an ether alcohol as solvent and of an alkali metal sulfide.

3,657,284
DYESTUFFS

Gerald Booth and Trevor James Smith, Manchester, and Cyril Eric Vellins, Gatley, England, assignors to Imperial Chemical Industries Limited, London, England

No Drawing. Continuation-in-part of application Ser. No. 663,547, Aug. 28, 1967. This application Nov. 24, 1970, Ser. No. 92,528
Claims priority, application Great Britain, Sept. 2, 1966, 39,319/66
Int. Cl. C09b 1/32, 1/56
U.S. Cl. 260—378 1 Claim

Anthraquinone dyestuffs which are half sulphuric esters of compounds of the formula:



wherein the aromatic nucleus A may be substituted by halogen, lower alkyl or lower alkoxy in addition to the substituent Y;

X represents hydrogen, lower alkyl, cyclohexyl or benzyl;
Y represents hydroxy lower alkyl, hydroxy lower alkoxy lower alkyl or hydroxy lower alkylthio; and
Z represents hydrogen, halogen or lower alkyl.

The dyestuffs give fast blue shades on nylon.

3,657,285

WATER INSOLUBLE BLUE ANTHRAQUINONE DYES FOR CELLULOSIC AND SYNTHETIC FIBERS

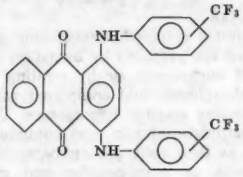
John Blackwell, Kennett Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 879,900, Nov. 25, 1969. This application Dec. 22, 1970, Ser. No. 100,798

Int. Cl. C09b *1/32*

U.S. Cl. 260—381 **2 Claims**

Water insoluble blue anthraquinone dyes, useful for dyeing cellulosic or synthetic fibers or blends or mixtures thereof, having the formula



3,657,286

PREPARATION OF A WATER SOLUBLE BISULFITE DERIVATIVE OF MENADIONE

William Richard Micheli, Gurnee, Ill., assignor to Abbott Laboratories, Chicago, Ill.

No Drawing. Filed Nov. 23, 1970, Ser. No. 92,300

Int. Cl. C07c *49/66*

U.S. Cl. 260—396 K **4 Claims**

It has been found that by using the proper reaction medium the bisulfite addition product of menadione can be obtained in greater purity, quantitative yield and by a simpler recovery step. The medium used consists of a combination of water and carbon tetrachloride.

3,657,287

METHOD FOR PRODUCING ISOPRENOID QUINONES

Yutaka Kawamatsu and Hirosada Sugihara, Osaka, and Hiroshi Morimoto, Nishinomiya, Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

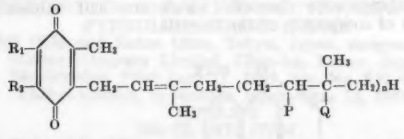
No Drawing. Filed Oct. 15, 1969, Ser. No. 866,735

Claims priority, application Japan, Oct. 16, 1968, 43/75,365

Int. Cl. C07c *49/64, 49/66*

U.S. Cl. 260—396 K **10 Claims**

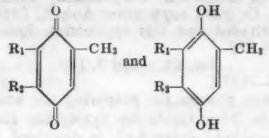
Method of producing isoprenoid quinone compounds of the formula



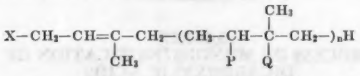
useful as vitamins or coenzymes, where R_1 and R_2 are methoxy or methyl or taken together represent

—CH=CH—CH=CH—

P and Q are hydrogen atoms or taken together a double bond and *n* is an integer of from 0 to 9, by subjecting one of the compounds of the formulae



where R_1 and R_2 are as above-defined, to condensation with a compound of the formula



where P, Q and *n* are as above-defined and X is halogen, in the presence of zinc amalgam or palladium and subjecting the condensation product to oxidation.

3,657,288

CYCLOBUTANONES AND PROCESS FOR THE PREPARATION THEREOF

Rudolf Wiechert, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin, Germany

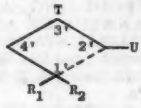
No Drawing. Filed Mar. 2, 1970, Ser. No. 15,884

Claims priority, application Germany, Mar. 6, 1969, P 19 12 236.2; July 18, 1969, P 19 37 613.7

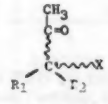
Int. Cl. C07c *169/22*

U.S. Cl. 260—397.3 **22 Claims**

Cyclobutanones of the formula



wherein R_1 and R_2 each are alkyl or cycloalkyl groups or, collectively with the 1'-carbon atom of the cyclobutanone ring, a monocyclic or polycyclic cycloalkyl group, e.g., a spirosteroidal group attached by its 17-position carbon atom, and one of T and U is an oxygen atom and the other are two hydrogen atoms, are produced by reacting an α-chloro- or α-bromo-ketone of the formula



wherein R_1 and R_2 have the values given above and X is Cl or Br, with dimethylmethylene sulfonium oxide.

3,657,289

1α-METHYL-2-FORMYL-5α-ANDROST-2-EN-17-ONE AND DERIVATIVES

Paul D. Klimstra, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

No Drawing. Filed Mar. 29, 1971, Ser. No. 129,115

Int. Cl. C07c *169/20*

U.S. Cl. 260—397.3 **7 Claims**

1α-methyl-2-formyl-5α-androst-2-en-17-one and its derivatives are produced from the appropriate 1α-methyl-17β-hydroxy-17α-(optionally alkylated)-5α-androstan-3-ones and are valuable pharmacological agents as is

evidenced by their anti-estrogenic, androgenic and anabolic activities.

3,657,290
SULFATED 11β-METHYL ESTROGENS
Ivar Laos, Skokie, and John S. Baran, Morton Grove, Ill., assignors to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed Apr. 8, 1971, Ser. No. 132,557
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.45 5 Claims

The above-captioned compounds are produced from 3-hydroxy - 11β-methylestra-1,3,5(10)-trien-17-one by successive reactions with sulfamic acid in pyridine and an alkali metal hydroxide and are useful pharmacological agents, e.g. estrogens.

3,657,291
3,11-DIHALO-2,3,7,11-TETRA-ALKYL-4,6-DIENOIC ACID ESTERS
Václav Jarolím, Karel Hejno, Karel Sláma, and František Sorm, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia
No Drawing. Filed Sept. 25, 1969, Ser. No. 861,139
Claims priority, application Czechoslovakia, Sept. 30, 1968, 6,793/68
Int. Cl. A01n *9/24*; C07c *69/62*
U.S. Cl. 260—408 11 Claims

Methods employing and compositions comprising novel 3,11-dihalides of esters of 2,7,11-trialkyl-3-alkylene-4,6,10-trienoic acids useful for the control of insects.

3,657,292
PROCESS FOR THE PREPARATION OF 2-ACYLOXYCYCLODODECANONES
George William Parshall, Wilmington, Del., assignor to E. I. duPont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 15, 1970, Ser. No. 37,929
Int. Cl. C07c *67/04, 69/14, 55/04*
U.S. Cl. 260—410 5 Claims

A 2-acyloxycyclododecanone is prepared by the oxidation of cyclododecene with rhenium heptoxide in the presence of a carboxylic acid anhydride. A 2-acyloxycyclododecanone can be further oxidized with hydrogen peroxide to 1,12-dodecanedioic acid, which is useful as a starting material for the preparation of fiber-forming polycarbonamides.

3,657,293
PRODUCTION OF ALKANOIC ACIDS
Robert J. Fanning, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 638,613, May 15, 1967. This application May 7, 1970, Ser. No. 35,583
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 10 Claims

Carboxylic acid of high purity and high stability is prepared by hydrogenative purification of a starting alkanol feed having from about 4 to about 30 carbon atoms per molecule by caustic fusing the alkanol to produce salts or soaps of the corresponding acids having from about 4 to about 30 carbon atoms per molecule, by stripping the salts to remove unsaponifiable materials, by converting the stripped salts to carboxylic acid by treatment with mineral acid solutions, and purifying the acid by a two-stage treatment of topping and flashing to remove light and heavy components present. Where the starting alkanol is a wide range mixture as regards molecular weight, the product acid is preferably distilled into narrow cuts and even individual molecular weight acids.

3,657,294
PROCESS FOR PREPARING ORGANOTIN MERCAPTIDES
Carl Robert Gloskey, Stirling, N.J., assignor to M & T Chemicals Inc., New York, N.Y.
No Drawing. Original application Jan. 2, 1967, Ser. No. 694,829. Divided and this application Mar. 16, 1970, Ser. No. 20,061
Int. Cl. C07d *7/22*
U.S. Cl. 260—429.7 2 Claims

The present invention provides a novel non-toxic organotin stabilizer composition containing about 95 percent of di(n-octyl)Sn S,S' - bis(isooctylmercaptoacetate). The stabilizer composition also contains specified amounts of other organic tin compounds. The invention also provides non-toxic polyvinyl chloride containing resins suitable for food packaging use.

3,657,295
PREPARATION OF TRI-n-BUTYL VANADATE
David R. McCoy, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.
No Drawing. Filed Nov. 23, 1970, Ser. No. 92,213
Int. Cl. C07f *9/00*
U.S. Cl. 260—429 R 7 Claims

Tri-n-butyl vanadate is produced in significantly high yields when vanadium pentoxide (V_2O_5) is reacted with n-butanol in the presence of toluene. A stoichiometric excess of n-butanol further enhances the improved yields. Yields are further improved in a preferred embodiment when condensed vapors of butanol and toluene pass through a quantity of vanadium pentoxide and are returned to a refluxing quantity of butanol and toluene.

3,657,296
ORGANOGOLD COMPOUNDS
Lawrence G. Vaughan, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed July 30, 1970, Ser. No. 59,713
Int. Cl. C07f *1/12*
U.S. Cl. 260—430 11 Claims

There is provided novel organogold compounds having the formula $RNCAuR_1$ where R is an alkyl group containing up to 12 carbon atoms or an aryl group containing up to 12 carbon atoms in the ring system where R_1 is an alkyl group containing up to 12 carbon atoms, an aryl group containing up to 12 carbon atoms in the ring system or a heterocyclic 5- or 6-membered ring containing O, S or N in the ring, and Au is gold in the +1 oxidation state. These compounds are useful in the production of gold films.

3,657,297
PREPARATION OF DICYCLOPENTADIENYL-COBALT
Courtland K. Spicer and John M. Birmingham, Boulder, Colo., assignors to Syntex Corporation, Apartado, Panama, Republic of Panama
No Drawing. Filed Nov. 6, 1970, Ser. No. 87,579
Int. Cl. C07f *15/06*
U.S. Cl. 260—439 CY 11 Claims

A new process for the preparation of dicyclopentadienylcobalt, a commercially useful compound, involves reacting metallic cobalt and hydrogen chloride to prepare an anhydrous alcoholic mixture of cobaltous chloride, contacting said mixture with an alkali metal lower alkylate to prepare an anhydrous alcoholic mixture of cobaltous lower alkylate, contacting said mixture with cyclopentadiene. The product dicyclopentadienylcobalt is optionally recovered from the reaction mixture.

3,657,298

ARSENIC AND PHOSPHORUS CONTAINING POLYDENTATES

Robert Bruce King, Athens, Ga., and Pramesh N. Kapoor, Pittsburgh, Pa., assignors of fractional part interest to Pressure Chemical Co., Pittsburgh, Pa.

No Drawing. Filed Jan. 6, 1970, Ser. No. 1,058
Int. Cl. C07f 9/50, 9/74
U.S. Cl. 260—440 16 Claims

Polydentate compounds including (1) polytertiary phosphines, (2) polytertiary arsines, and (3) polytertiary arsino-phosphines, containing four or more trivalent phosphorus atoms, four or more trivalent arsenic atoms, and a combination of four or more trivalent phosphorus atoms and trivalent arsenic atoms, respectively, with a bridge of two carbon atoms, for example, —CH=CH— or —CH_2—CH_2—, between at least two of the phosphorus atoms, two of the arsenic atoms, and the phosphorus and arsenic atom, respectively, and (4) polytertiary arsino-phosphines containing at least one trivalent phosphorus atom and at least one trivalent arsenic atom with a bridge of two carbon atoms, for example, —CH=CH— or —CH_2—CH_2—, bewteen the phosphorus and arsenic atoms, said compounds being useful as additives in gasolines and for forming complexes with metal carbonyls and metal halides for use as catalysts in the polymerization or oligomerization of olefins and acetylenes and in hydrogenation processes; and the base-catalyzed addition process of synthesizing the foregoing compounds wherein the addition of compounds with phosphorus-hydrogen bonds or arsenic-hydrogen bonds to vinyl or ethylnyl phosphorus or arsenic derivatives is brought about, each of the phosphorus and arsenic being in its trivalent state.

3,657,299

PROCESS FOR PRODUCING TRIETHYLALUMINUM

Eiichi Ichiki, Yasuhiko Inoue, Yoshihiro Kondo, and Tadaaki Yako, Niihama, Japan, assignors to Sumitomo Chemical Co., Ltd.

No Drawing. Filed May 4, 1970, Ser. No. 34,588
Claims priority, application Japan, May 6, 1969, 44/34,954
Int. Cl. C07f 5/06
U.S. Cl. 260—448 A 15 Claims

The present invention provides an improved process for producing high purity triethylaluminum, which comprises reacting ethylene with an alkylaluminum compound in the presence of a catalyst system comprising (1) a nickel compound and (2) at least one organic compound selected from the group consisting of conjugated diolefins and their oligomers, diallyl ethers and their derivatives, styrene and its derivatives, acrylic acid esters and their derivatives and nitrile compounds.

3,657,300

PREPARATION OF DIHYDROCARBYL ALUMINUM HALIDES AND DIHYDROCARBYL ALUMINUM ALKOXIDES

Phillip R. Beaver and James C. Geddes, Jr., Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Feb. 2, 1970, Ser. No. 8,024
Int. Cl. C07f 5/06
U.S. Cl. 260—448 A 11 Claims

It is disclosed that high purity dihydrocarbyl aluminum halides and dihydrocarbyl aluminum alkoxides are produced by a plural step process which involves a reaction to produce a hydrocarbyl aluminum dihalide or hydrocarbyl aluminum dialkoxide which is purified by distillation and then reacted with trihydrocarbyl aluminum in about stoichiometric proportions to produce the desired product without requiring further purification.

3,657,301

INHIBITION OF POLYMER AND OLEFIN FORMATION DURING ALUMINUM TRIALKYL GROWTH REACTION

Kaye L. Motz and Allan J. Lundeen, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

No Drawing. Continuation-in-part of application Ser. No. 862,075, Sept. 29, 1969. This application Nov. 26, 1969, Ser. No. 880,427
Int. Cl. C07f 5/06
U.S. Cl. 260—448 A 10 Claims

Carbon monoxide or other ligand for transition metals inhibits the formation of polymer and catalytic displacement when aluminum trialkyl such as aluminum triethyl is reacted with additional ethylene to form higher molecular weight aluminum trialkyls. It is also disclosed that carbon monoxide inhibits the hydrogenation reaction and therefore should be avoided in the reaction zone wherein aluminum triethyl, aluminum and hydrogen are reacted.

3,657,302

PROCESS FOR THE PREPARATION OF ORGANOSILICON COMPOUNDS HAVING HYDROGEN DIRECTLY BONDED TO SILICON

Norbert Duffaut, Barsac, Jacques Dunogues, Talence, Raymond Calas, Le Bouscat, and Gilbert Marin, Sainte-Foy-les-Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed June 12, 1970, Ser. No. 45,934
Claims priority, application France, June 16, 1969, 6919961; July 17, 1969, 6924384
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 E 10 Claims

Organosilicon compounds containing silicon bonded to hydrogen are made by reacting organosilicon compounds containing silicon bonded to chlorine with hydrogen chloride, free or combined, and magnesium or aluminium, in the presence of a hexaalkylphosphotriamide.

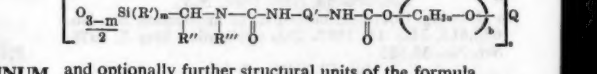
3,657,303

SILOXANE-MODIFIED UREA DERIVATIVES

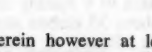
Hans Dietrich Golitz, Cologne-Stammheim, Eberhart Degener, Leverkusen, and Gunter Oertel, Cologne-Flittard, Germany, Hans-Georg Schmelzer, New Martinsville, W. Va., and Walter Simmler, Odenthal-Schlinghofen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 28, 1970, Ser. No. 6,576
Claims priority, application Germany, Feb. 1, 1969, P 19 05 100.4
Int. Cl. C07f 7/10, 7/18
U.S. Cl. 260—448.2 N 6 Claims

New organosiloxane- and carbamate-modified urea derivatives comprise at least one structural unit of the formula



and optionally further structural units of the formula

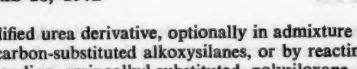


wherein however at least one of a thousand structural units corresponds to the first of the above formulae.

In these formulae R′ is a monovalent hydrocarbon radical, R″ and R‴ are hydrogen atoms or monovalent hydrocarbon radicals, Q′ is a bivalent hydrocarbon radical, Q is a monovalent to hexavalent hydrocarbon radical, *m* is 0, 1 or 2, *n* is 2, 3 or 4, *a* is 0, 1, 2 or 3, *b* is zero or an integer from 1 to 200, and *c* is the valency number of Q.

These urea derivatives are prepared either by hydrolyzing a corresponding alkoxysilyl-substituted carbamate-

modified urea derivative, optionally in admixture with hydrocarbon-substituted alkoxysilanes, or by reacting a corresponding aminoalkyl-substituted polysiloxane with an isocyanate-modified carbamic acid ester of the formula



The products are to be used as priming agents imparting adhesion to synthetic resins on siliceous surfaces, as surfactants and as intermediates for organo-polysiloxane resins.

3,657,304

BIS(CYANOORGANOSILYL)HYDROCARBONS, BIS (AMINOORGANOSILYL)HYDROCARBONS AND METHODS FOR MAKING THEM

Fred F. Holub, Abe Berger, and Terry G. Selin, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Nov. 28, 1969, Ser. No. 880,922
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 N **8 Claims**

Bis(aminoorganosilyl)hydrocarbons, such as 1,4 - bis-(aminobutyldimethylsilyl)benzene are made by hydrogenating the corresponding bis(cyanoorganosilyl)hydrocarbons. The bis(cyanoorganosilyl)hydrocarbons can be made by the platinum catalyzed addition of an aliphatically unsaturated nitrile such as allyl cyanide to a bis (organosilyl)hydrocarbon such as bis(dimethylsilyl)benzene. The bis(aminoorganosilyl)hydrocarbons are useful as silanol curing agents, and as intermediates for making polyimides; the bis(cyanoorganosilyl)hydrocarbons can be employed as antistats for synthetic fibers, additives for channel sealant greases to impart improved solvent characteristics thereto, etc.

3,657,305

SILOXANE-POLYOXYALKYLENE BLOCK COPOLYMERS CONTAINING ARALKYL GROUPS

Edward L. Morehouse, 7 Wren Lane, New City, N.Y. 10956

No Drawing. Filed Dec. 24, 1969, Ser. No. 888,033
Int. Cl. C07f 7/02
U.S. Cl. 260—448.2 B **6 Claims**

This invention relates to novel siloxane-polyoxyalkylene block copolymers containing silicon-bonded aralkyl groups. The novel block copolymers are useful as foam stabilizers in the production of polyurethane foams, especially in the production of open-cell flexible polyether polyurethane foams having reduced flammability.

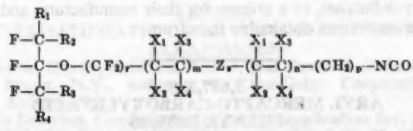
3,657,306

POLYFLUOROISOALKOXYALKYL ISOCYANATES

John J. Murray, Millington, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 21, 1969, Ser. No. 868,216
Int. Cl. C07c 119/04
U.S. Cl. 260—453 AL **25 Claims**

Compounds of the formula



wherein R_1–R_4 can be fluorine, chlorine or perhaloalkyl, the halo portions being fluorine or chlorine; X_1–X_4 can be hydrogen, fluorine, chlorine or bromine; Z is

$$—CH_2—CH_2—$$

or —CH=CH—; *r* is an integer from 1 to 2, *m* and *n* are integers from 0 to 20 and *s* and *p* are integers from 0 to 1. These compounds are surface active agents and can be used to impart oil and water repellent properties to materials such as textiles and leathers.

3,657,307

DIALKYL AND DIALKENYL N,N'-BIS(SUBSTITUTED CARBAMOYLOXY) DITHIOLOXALIMIDATES

John C. Summers, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Aug. 18, 1967, Ser. No. 661,510, now Patent No. 3,514,516, dated May 26, 1970. Divided and this application Oct. 8, 1969, Ser. No. 871,225
Int. Cl. C07c 119/00
U.S. Cl. 260—453 R **4 Claims**

Chemical compounds of the class dialkyl and dialkenyl N,N' - bis(substituted carbamoyloxy)dithioloxalimidates, such as dimethyl N,N'-bis(methylcarbamoyloxy)-dithioloxalimidate, useful in preventing the destructive effects of nematodes.

3,657,308

CATALYTIC CARBONYLATION OF AROMATIC NITRO COMPOUNDS IN THE PRESENCE OF ORGANIC CARBONATES

Ehrenfried H. Kober, Hamden, and Wilhelm J. Schnabel, Branford, Conn., assignors to Olin Mathieson Chemical Corporation

No Drawing. Filed Apr. 16, 1969, Ser. No. 816,836
Int. Cl. C07c 119/04
U.S. Cl. 260—453 PC **15 Claims**

In the process for preparing an organic isocyanate by reacting an organic nitro compound with carbon monoxide in the presence of a catalyst, improved yields of the organic isocyanate are obtained and contamination of the isocyanate by products derived from ortho-dinitro compounds is supressed when the reaction is carried out in the presence of an organic carbonate. In addition, when the catalyst is a noble metal halide complex of Lewis base such as pyridine or isoquinoline, decomposition of the catalyst complex is diminished.

3,657,309

ALKYLHYDROXYPHENYLTHIOLALKANOATES

Martin Dexter, Briarcliff Manor, David H. Steinberg, Bronx, and George E. Ham, Briarcliff Manor, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed May 13, 1968, Ser. No. 728,761
Int. Cl. C07c 153/07
U.S. Cl. 260—455 C **9 Claims**

Alkylhydroxyphenylalkanoic acid thiolo esters of mono- and polymercaptoalkanes prepared by known thiolo esterification procedures, are stabilizers of organic material subject to oxidative deterioration.

3,657,310

PROCESS FOR MAKING ALIPHATIC CARBONATE ESTERS

Ludo K. Frevel, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 14, 1969, Ser. No. 850,215
Int. Cl. C07c 67/00, 67/02, 69/00
U.S. Cl. 260—463 **5 Claims**

Esters of the formula

$$ROCOO(AO)_nR'$$

wherein R and R' are monovalent aliphatic radicals, A is an alkylene radical of 2–4 carbon atoms and *n* is an integer at least 1, are made by

(1) Reacting an alkali metal bicarbonate ester with methyl chloride, bromide or iodide:

$$ROCOOM+CH_3X \rightarrow ROCOOCH_3+MX$$

wherein M is alkali metal and X is Cl, Br or I, and (2) Reacting the above methyl ester with a monoether of an alkylene glycol or polyglycol:

$$ROCOOCH_3+HO(AO)_nR' \rightarrow ROCOO(AO)_nR'+CH_3OH$$

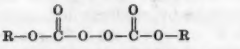
In a preferred process, step 1 is conducted in the presence of the glycol ether, thus combining the two steps.

3,657,311
DI(CIS-3,3,5-TRIMETHYLCYCLOHEXYL) PEROXYDICARBONATE
Antonio Joseph D'Angelo, Buffalo, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.
No Drawing. Filed July 15, 1969, Ser. No. 841,998
Int. Cl. C07c *73/10;* C07f *1/60*
U.S. Cl. 260—463 3 Claims

Essentially pure di(cis - 3,3,5 - trimethylcyclohexyl) peroxydicarbonate and solid cis-trans peroxydicarbonates having at least 70% of the 3,3,5-trimethylcyclohexyl radicals of the cis form. These are initiators for the polymerization of monomers containing ethylenic unsaturation, such as, ethylene, vinyl chloride and allyl phthalate, to solid polymers.

3,657,312
BICYCLOALKYL PEROXYDICARBONATES
Antonio Joseph D'Angelo, Buffalo, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.
No Drawing. Filed July 15, 1969, Ser. No. 841,999
Int. Cl. C07c *73/00, 73/10;* C08f *1/60*
U.S. Cl. 260—463 7 Claims

Bicycloalkyl peroxydicarbonate having the formula, where R is a bicycloalkyl radical having 4–30 carbon atoms:



Examples are di-bornyl peroxydicarbonate and di(3-bicyclo[4.4.0]decyl) peroxydicarbonate. These peroxydicarbonates are initiators for the polymerization of monomers containing ethylenic unsaturation, such as, ethylene, vinyl chloride and allyl phthalate, to solid polymers.

3,657,313
PREPARATION OF 1-CYANOCYCLOBUTENE FROM 1,2-DICYANOCYCLOBUTANE
David M. Gale, Chalfonte, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed June 11, 1969, Ser. No. 832,457
Int. Cl. C07c *121/48*
U.S. Cl. 260—464 19 Claims

Processes for preparing 1-cyanocyclobutene by contacting 1,2-dicyanocyclobutane with certain bases or solid basic oxidation catalysts. Exemplary of bases are metals such as lithium, sodium and potassium, their oxides, hydroxides, carbonates, hydrides and amides. Exemplary of solid basic oxidation catalysts are those that catalyze oxidation or oxydehydrogenation reactions as for example the oxides of magnesium, zinc, barium, calcium; the cyanides of sodium, potassium, calcium; and the like.

3,657,314
CARBOXYLIC ACID ESTERS OF DI-LOWER ALKYLHYDROQUINONES
Eduard K. Kleiner, Dobbs Ferry, N.Y., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,098
Int. Cl. C07c *69/38, 69/76, 121/66*
U.S. Cl. 260—465 D 10 Claims

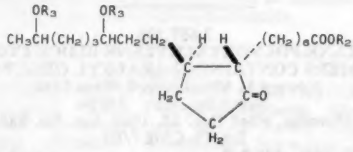
Organic materials, particularly synthetic polymers such as polypropylene, are protected against oxidation in air, thermal degradation or deterioration by including, in such substances, a stabilizing amount of an antioxidant. The antioxidant is obtained by reacting (a) and α,β-unsaturated ester of a hindered hydroquinone and (b) a malonate or a related compound with an active methylene group.

3,657,315
PURIFICATION OF ADIPONITRILE
Anton Wegerich, Limburgerhof, Wolfgang Arend, Ludwigshafen, Emil Himmelhan, Heidelberg, and Arnold Wittwer, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Dec. 3, 1969, Ser. No. 881,935
Claims priority, application Germany, Dec. 4, 1968, P 18 12 525.2
Int. Cl. C07c *121/26*
U.S. Cl. 260—465.8 5 Claims

Purification of adiponitrile by crystallization from an alkanol having from four to eight carbon atoms. The process is particularly suitable for the purification of adiponitrile containing cyanocyclopentanonimine. Adiponitrile is an intermediate for the production of nylon-6, a fiber intermediate.

3,657,316
15,19-DIHYDROXY-9-KETO-PROSTANOIC ACID
Bengt Samuelsson, % Royal Veterinary College, Department of Medical Chemistry, Stockholm 50, Sweden
Continuation-in-part of application Ser. No. 481,777, Aug. 23, 1965. This application Mar. 9, 1970, Ser. No. 17,829
Int. Cl. C07c *61/36, 69/16, 69/74*
U.S. Cl. 260—468 R 8 Claims

The invention is a group of prostanoic acid derivatives of the formula:



wherein R_2 is hydrogen, hydrocarbyl, or a pharmacologically acceptable cation, and R_3 is hydrogen or carboxyacyl. These compounds are useful for a variety of pharmacological purposes, including blood pressure lowering, anti-ulcer, and wound healing.

3,657,317
1,3-FUNCTIONALLY DISUBSTITUTED BICYCLOBUTANES
Charles Eugene Coffey, Brandywood, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed June 5, 1967, Ser. No. 643,339
Int. Cl. C07c *61/12, 69/74*
U.S. Cl. 260—468 B 13 Claims

This invention relates to 1.3-functionally disubstituted bicyclobutanes, to a process for their manufacture, and to homopolymers obtainable therefrom.

3,657,318
ARYL MERCAPTO-CARBOXYLIC ACID PHENYL ESTERS
Peter E. Newallis, Leawood, Kans, and Albert J. Poje and Daniel M. Wasleski, Kansas City, Mo., assignors to Chemagro Corporation, Kansas City, Mo.
No Drawing. Filed Mar. 17, 1969, Ser. No. 807,977
Int. Cl. C07c *149/34*
U.S. Cl. 260—470 5 Claims

Mercapto-carboxylic acid phenyl esters, i.e. (alkyl, phenyl, chloro- and/or alkyl-substituted phenyl, cyano,

dialkylaminothiocarbonyl, alkoxycarbonyl-alkyl, benzothiazolyl and alkoxy-substituted benzothiazolyl)-mercapto-acetic acid (mono- to penta- chloro, bromo, alkoxy, fluoroalkyl and/or nitro substituted)-phenyl esters, which possess fungicidal properties and which may be produced by conventional methods.

3,657,319

α-AMINOALKYL-4-HYDROXY-3-CARBOALKOXY-AMINOBENZYL ALCOHOLS

Carl Kaiser, Haddon Heights, N.J., and Stephen T. Ross, Berwyn, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed May 5, 1970, Ser. No. 34,893

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **10 Claims**

α-Aminoalkyl-4-hydroxy-3-carboalkoxyaminobenzyl alcohols having β-adrenergic stimulant activity, particularly as selective bronchodilators, are prepared from 3-amino-4-benzyloxyphenones by conversion to an isocyanate, reaction with a lower alkanol to give 3-carboalkoxyaminophenones, bromination of these phenones and treatment of the resulting α-bromo derivatives with an N-benzyl secondary amine, followed by catalytic hydrogenation to remove the benzyl groups and reduce the ketone moiety.

3,657,320

PERFLUOROALKOXYALKYL-SUBSTITUTED CARBAMATES

Louis G. Anello, Basking Ridge, and Richard F. Sweeney, Dover, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Nov. 8, 1968, Ser. No. 774,518

Int. Cl. C07c *125/06*

U.S. Cl. 260—471 C **13 Claims**

Carbamates and dicarbamates of fluorocarbon alcohols characterized by having a polyfluoroisoalkoxyalkyl tail wherein an ether oxygen atom links a fluorinated carbon atom connected to two fluoroalkyl groups and at least one $—CF_2—$ group. These compounds are useful to impart oil and water resistance to fabrics, leather, and the like.

3,657,321

4,4'-ALKYLIDENE-DIPHENOL-BIS-(DI-t-BUTYL-4'''-HYDROXYPHENYL) ALKANOATES

David Herbert Steinberg, Bronx, Martin Dexter, Briarcliff Manor, and John D. Spivack, Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Filed Apr. 30, 1969, Ser. No. 820,645

Int. Cl. C07c *69/76;* **C08f** *45/58*

U.S. Cl. 260—473 S **4 Claims**

Novel hydroxyalkylarylalkanoates and hydroxyalkylbenzoates are provided by a procedure involving reacting a suitable diphenol or a dihydroxybenzene with a hydroxyalkylarylalkanoyl halide or hydroxyalkylbenzoyl halide. The hydroxyalkylarylalkanoate and hydroxyalkylbenzoate products are useful as stabilizers of organic materials which are subject to oxidative deterioration.

3,657,322

CYCLOALIPHATIC DIALKYLHYDROXYPHENYL-ALKANOATES

Martin Dexter, Briarcliff Manor, and David H. Steinberg, Bronx, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 372,083, June 2, 1964. This application June 26, 1967, Ser. No. 648,998

Int. Cl. C07c *69/76*

U.S. Cl. 260—473 S **3 Claims**

Alkylhydroxyphenylalkanoic acid esters of mono- and polyhydric alicyclic alcohols, prepared by known esterification or transesterification procedures, are stabilizers of organic material subject to oxidative deterioration.

3,657,323

BUTENE POLYCARBOXYLIC ACID ESTERS

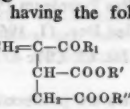
Ken-Ichi Morita and Tsuneo Kobayashi, Kamakura, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

No Drawing. Original application Mar. 31, 1967, Ser. No. 627,289, now Patent No. 3,538,147, dated Nov. 3, 1970. Divided and this application June 24, 1970, Ser. No. 49,528

Int. Cl. C07c *69/66, 69/76*

U.S. Cl. 260—475 SC **7 Claims**

Novel compounds having the following formula:



wherein R' and R'' are the same or different and represent an alkyl group having up to 18 carbon atoms, an alkenyl group having up to 18 carbon atoms, an aryl group having up to 10 carbon atoms, an aralkyl group having up to 10 carbon atoms, or a cycloalkyl group having up to 10 carbon atoms; wherein R_1 represents hydrogen, an alkyl group having up to 6 carbon atoms, an aryl group having up to 10 carbon atoms or

wherein R_2 and R_3 are the same or different and each represents an alkyl group having up to 6 carbon atoms or a phenyl group or when taken together R_2 and R_3 represent an alkylene or oxyalkylene group having 4 or 5 carbon atoms.

3,657,324

HYDRAZINE DERIVATIVES AND PROCESS THEREFOR

Chester Stephen Sheppard, Tonawanda, and Leonard Earnest Korczykowski, North Tonawanda, N.Y., assignors to Pennwalt Corporation

No Drawing. Continuation-in-part of application Ser. No. 409,306, Nov. 5, 1964. This application Nov. 21, 1967, Ser. No. 684,652

Int. Cl. C07c *125/04, 133/00*

U.S. Cl. 260—482 B **18 Claims**

(a) 1,2-disubstituted hydrazines are made by reacting a defined N-monohalosubstituted urea with an alkaline material in an organic solvent in the presence of a compound affording an active hydrogen. Methyl ethyl hydrazodiformate was made by reacting N-chloro-N-methoxycarbonylurea with ethanol in the presence of sodium ethoxide.

(b) Monosubstituted hydrazines are made by reacting a suspension in liquid water of N-monohalosubstituted urea, with an alkaline material which is continuously present. N-chloro-N'-t-butylurea was added to aqueous NaOH at 5° C.; t-butylhydrazine hydrochloride was recovered.

(c) Certain di-R-hydrazodiformates where R is alkyl, aralkyl, cycloalkyl, aryl, alkali metal or alkaline earth metal such as methyl ethyl hydrazodiformate and sodium ethyl hydrazodiformate.

3,657,325

ESTERS OF SUBSTITUTED GLYOXYLIC ACIDS

James E. Siggins, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 613,457, Feb. 2, 1967. This application Dec. 3, 1969, Ser. No. 881,892

Int. Cl. C07c *69/66*

U.S. Cl. 260—483 **4 Claims**

The compounds are esters and amides of alkylglyoxylic and arylglyoxylic acids, prepared from the free acids and

the appropriate substituted alcohol, amine or alkyl halide. The compounds are useful as plasticizers, and the members of a subgroup are useful as hypoglycemic agents.

3,657,326

PRODUCTION OF ALKENYL ALKANOATES

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Dec. 11, 1969, Ser. No. 884,352

Int. Cl. C07c *67/00*

U.S. Cl. 260—491 10 Claims

Alkenyl alkanoates are produced by reacting 1-alkenes and methylene dialkanoates in the presence of a Lewis acid catalyst.

3,657,327

PROSTAGLANDIN SALTS OF TRIS(HYDROXYMETHYL)AMINOMETHANE

Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed June 1, 1970, Ser. No. 42,458

Int. Cl. C07c *91/02*

U.S. Cl. 260—501.17 6 Claims

Free flowing crystals of the tris(hydroxymethyl) aminomethane salts of PGE_2 and $PGF_{2\alpha}$, and processes for producing those, are disclosed. Those crystals are useful for the same pharmacological and medical purposes as PGE_2 and $PGF_{2\alpha}$, and are also useful as a means for purifying PGE_2 and $PGF_{2\alpha}$.

3,657,328

PGE_1 OXIMES

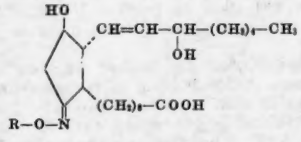
Neville Finch, West Orange, N.J., assignor to Ciba-Geigy Corporation, Summit, N.J.

No Drawing. Continuation-in-part of application Ser. No. 704,533, Feb. 12, 1968, now Patent No. 3,532,721, which is a continuation-in-part of application Ser. No. 640,374, May 22, 1967, now Patent No. 3,538,120. This application May 22, 1970, Ser. No. 39,870

Int. Cl. C07c *131/08*

U.S. Cl. 260—514 R 6 Claims

The hydrolysis of oximes having the formula



R=H, alkyl, alkenyl, cycloalkyl, haloalkyl or aralkyl

the esters and/or salts thereof, yields the corresponding hypotensive and luteolytic ketone, i.e. prostaglandin E_1.

3,657,329

PHENANTHRENE-2-CARBOXYLIC ACIDS

John A. Edwards, Los Altos, and John H. Fried, Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

No Drawing. Filed May 15, 1967, Ser. No. 638,648

Int. Cl. C07c *65/14, 69/76*

U.S. Cl. 260—514.5 4 Claims

Processes and intermediates for the synthesis of cis and trans racemates of phenanthrene-2-carboxylic acids.

3,657,330

PURIFICATION OF TEREPHTHALIC ACID

Johan W. Garritsen, Geleen, and Johannes H. C. M. A. Gregorie, Beek Limburg, Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

No Drawing. Filed Jan. 7, 1970, Ser. No. 1,314

Int. Cl. C07c *51/42, 51/48*

U.S. Cl. 260—525 4 Claims

A process is described for the purification of crude terephthalic acid, contaminated with impurities such as para-toluic acid and para-carboxy benzaldehyde, wherein the crude terephthalic acid is dissolved in a solvent mixture of water and acetonitrile at elevated pressures and temperatures in excess of normal boiling temperature of the solvent mixture, and the solution thereafter cooled to a lower temperature to permit recrystallization of purified terephthalic acid from the mother liquor.

3,657,331

PROCESS FOR PREPARING ACRYLIC OR METHACRYLIC ACID

Jacob Ackermann, Gorla Minore, Roberto Croce, Erba, and Riccardo Reguzzoni, Busto Arisizio, Italy, assignors to Societá Italiana Resine S.p.A., Milan, Italy

No Drawing. Filed June 10, 1969, Ser. No. 832,018

Int. Cl. C07c *57/04*

U.S. Cl. 260—526 N 12 Claims

A process for preparing acrylic or methacrylic acid, which comprises passing a polyoxymethylene diester of the formula:

$$R—CO—O\{CH_2O\}_xCO—R$$

where x has a value ranging from 1 to 3 and R is a member selected from the group consisting of a methyl and an ethyl radical, in the vapor phase, over a catalyst effective to convert the diester to acrylic or methacrylic acid, said catalyst being a member selected from the group consisting of

(a) oxides, hydroxides, and carbonates, of one or more metals selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, barium, boron, and aluminum, and

(b) natural aluminum silicates, synthetic aluminum silicates, molecular sieves, calcium phosphate, magnesium phosphate, magnesium silicate, and aluminum oxide, said process being carried out at a temperature ranging from 180° C. to 450° C.

3,657,332

PROCESS FOR ISOLATING ACRYLIC ACID FROM AN AQUEOUS CRUDE ACRYLIC ACID CONTAINING ACETIC ACID BY EXTRACTION AND DISTILLATION WITH AN ENTRAINER-SOLVENT

Kurt Sennewald and Klaus Gehrmann, Knapsack, near Cologne, Heinz Handte, Cologne, Alfred Hauser, Knapsack, near Cologne, and Georg Kohl, Hurth-Burbach, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany

Filed Oct. 24, 1969, Ser. No. 869,205

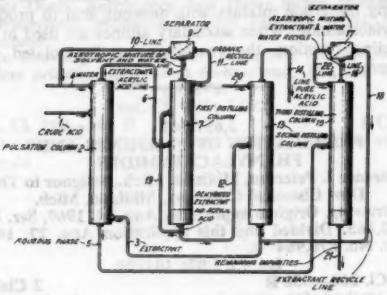
Claims priority, application Germany, Oct. 29, 1968, P 18 05 758.4

Int. Cl. B01d *3/36*

U.S. Cl. 260—526 N 10 Claims

Process for isolating pure acrylic acid from an aqueous crude acid containing acrylic acid together with small proportions of acetic acid, formaldehyde, acrolein, maleic acid and higher carboxylic acids and possibly polymeric acrylic acid, by extracting the crude acid using an organic solvent, water-washing the resulting organic extract, and distilling the washed extract to isolate acrylic acid therefrom. The aqueous, acrylic acid-containing crude acid is

extracted using 3,3,5-trimethylcyclohexanone and/or isophorone, the resulting organic extract is dehydrated in a



first distilling zone and base product coming from the first distilling zone is distilled in a second distilling zone to obtain pure acrylic acid.

3,657,333

PROCESS FOR THE PRODUCTION OF PURE FUMARIC ACID FROM AQUEOUS SOLUTIONS THEREOF

Paul Ackermann, Moers, and Helmut Heinrichs, Homberg (Lower Rhine), Germany, assignors to Polycarbona Chemie GmbH, Homberg (Lower Rhine), Germany

No Drawing. Filed June 6, 1969, Ser. No. 831,196
Claims priority, application Germany, June 8, 1968, P 17 68 629.2
Int. Cl. C07c *51/42, 57/14*
U.S. Cl. 260—527 R **9 Claims**

Pure fumaric acid is recovered from aqueous solutions containing it, especially from wash waters obtained in the cleaning of equipment for refining maleic acid or maleic acid anhydride, by filtering a hot aqueous solution of the raw fumaric acid, separating and drying the fumaric acid from the filtrate and subjecting it to a thermal treatment at 170 to 240° C. in an oxygen poor atmosphere, dissolving the resulting product in hot water, filtering the hot solution and treating the filtrate with decolorizing agents.

3,657,334

PROCESS FOR PRODUCING ADIPIC ACID

Girandra Narain Kulrestha, Derhadun (U.P.), India, and Irénée Seree de Roch, Rueil Malmaison, Hauts-de-Seine, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, France

No Drawing. Filed Dec. 4, 1969, Ser. No. 882,321
Int. Cl. C07c *51/28*
U.S. Cl. 260—531 R **17 Claims**

Adipic acid is prepared by oxidizing cyclohexanone in the liquid phase with molecular oxygen in the presence of a catalyst system consisting essentially of a manganese compound, a copper compound, and a compound of a metal from Group IIa of the Periodic Table, e.g., barium, calcium, magnesium, and strontium. The use of the compound of the Group IIa metal results in an increased yield of adipic acid.

3,657,335

PROCESS FOR PREPARING 1,12 DODECANEDIOIC ACID

Charles N. Winnick, Teaneck, N.J., assignor to Halcon International, Inc.

No Drawing. Filed May 13, 1968, Ser. No. 728,808
Int. Cl. C07c *55/04*
U.S. Cl. 260—533 C **3 Claims**

This invention relates to the preparation of dodecanedioic acid 1,12 by the direct nitric acid oxidation of cyclododecene epoxide.

3,657,336

NITROSO TERPOLYMERS AND THEIR PREPARATION

Nathan Mayes, Ironia, and Joseph Green, Dover, N.J., assignors to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Original application Oct. 24, 1965, Ser. No. 505,057. Divided and this application July 19, 1967, Ser. No. 662,248
Int. Cl. C07c *53/36*
U.S. Cl. 260—539 **11 Claims**

Terpolymers produced by contacting polyhalonitrosoalkanes, polyfluoroalkanes, and monobasic unsaturated acids having, preferably, ethylenic linkages.

3,657,337

BENZYLIDENEAMINO GUANIDINES

William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Filed Dec. 4, 1967, Ser. No. 687,425
Int. Cl. C07c *125/08*
U.S. Cl. 260—551 C **8 Claims**

This disclosure pertains to dichlorobenzylideneamino guanidines, e.g., 1 - (2,6 - dichlorobenzylideneamino)-3-methyl guanidine. These compounds are useful as hypotensives.

3,657,338

1,3 BIS(BICYCLOALKYL) UREAS

Jacob Szmuszkovicz, Kalamazoo, and Elisabeth Cerda, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Original application May 15, 1967, Ser. No. 638,562, now Patent No. 3,546,233. Divided and this application May 25, 1970, Ser. No. 48,675
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 R **2 Claims**

Compounds of the formula,

where R is polymethylene of 3 to 7 carbon atoms, R_1 is alkyl of not more than 2 carbon atoms, and n is zero or an integer not greater than 2. These compounds are useful as intermediates, for example in the preparation of hypoglycemics and quaternary ammonium disinfectants.

3,657,339

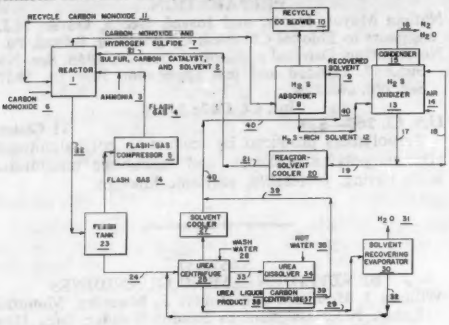
CONTINUOUS PROCESS FOR MAKING UREA

George S. Kutsher and George A. Elliott, Petersburg, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 26, 1969, Ser. No. 861,374
Int. Cl. C07c *127/00*
U.S. Cl. 260—555 S **8 Claims**

An improved solvent and process for making urea by reaction of ammonia, sulfur and carbon monoxide. The process involves the use of a reaction solvent comprising a mixture of dialkyl ethers of polyalkylene glycols having an average molecular weight between about 200 and about 400. By-product hydrogen sulfide is continuously stripped from the reaction mixture with excess carbon monoxide, absorbed in solvent recovered from the reaction product mixture, and oxidized to sulfur with an oxygen-containing gas in the presence of a carbon catalyst. The resulting

sulfur-containing solvent mixture is recycled to the urea synthesis reaction. Thus, only carbon monoxide, ammonia



and oxygen (air) are consumed in the overall process for production of urea.

3,657,340
PROCESS FOR PREPARING SUBSTITUTED β-HALOACRYLAMIDES

Francis Johnson, Newton, Mass., and Alin H. Gulbenk, Walnut Creek, Calif., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Jan. 31, 1969, Ser. No. 795,677
Int. Cl. C07c *103/58*
U.S. Cl. 260—557 R **4 Claims**

Compounds of the formula

$$R-NH-\overset{O}{\overset{\|}{C}}-C(R_1)=CH-X$$

wherein X is chloro, bromo or iodo, R is alkyl, aryl, alkaryl, aralkyl, alkenyl, alicyclic or cycloalkenyl, and R_1 is hydrogen, R, carbethoxyl, acetamidyl, or a fluoro, chloro, bromo or hydroxy-substituted R group, are prepared in the novel reaction comprising reacting by contacting an isocyanide of the formula R—NC with a haloacetylene of the formula $XC{\equiv}C{-}R_1$, wherein R and R_1 have the aforesaid meanings, in the presence of water. The compounds have biological utility as herbicides and insecticides.

3,657,341
ACETYL GLYCINE AMIDES

David E. Thorne, Crowthorne, England, assignor to Beecham Group Limited, Brentford, England

No Drawing. Filed May 21, 1969, Ser. No. 826,652
Claims priority, application Great Britain, June 4, 1968, 26,602/68, 26,612/68
Int. Cl. C07c *103/22*
U.S. Cl. 260—558 A **4 Claims**

Substituted acetyl glycine amides, their preparation and formulation for use as analeptics and anticonvulsants with tranquilizing, sedative and hypnotic properties of low toxicity at high dosages are described. Representative compounds are phenyl acetyl glycine dimethylamide, the halophenyl and phenoxy analogs and other lower alkyl or cyclic amides.

3,657,342
PREPARATION OF YNAMINES AND PHENYLACETAMIDES

Laurence I. Peterson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Aug. 24, 1967, Ser. No. 662,865, now Patent No. 3,499,928. Divided and this application Aug. 27, 1969, Ser. No. 870,963
Int. Cl. C07c *103/34*
U.S. Cl. 260—558 R **4 Claims**

A method for preparing ynamines and phenylacetamides comprises contacting phenylacetylenes with primary or secondary amines in the presence of copper and molecular oxygen to produce the ynamine, and then treating the crude mixture with aqueous acid to produce phenylacetamide. When secondary amines are used in the preceding reaction, the ynamines can be isolated and recovered.

3,657,343
PREPARATION OF YNAMINES AND PHENYLACETAMIDES

Laurence I. Peterson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Original application Aug. 24, 1969, Ser. No. 662,865. Divided and this application Aug. 27, 1969, Ser. No. 870,964
Int. Cl. C07c *103/30*
U.S. Cl. 260—558 R **2 Claims**

A method for preparing ynamines and phenylacetamides comprises contacting phenylacetylenes with primary or secondary amines in the presence of copper and molecular oxygen to produce the ynamine, and then treating the crude mixture with aqueous acid to produce phenylacetamide. When secondary amines are used in the preceding reaction, the ynamines can be isolated and recovered.

3,657,344
2-AMINOXY-2'-ACYL-ACETANILIDE

Arthur Stempel, Teaneck, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Application Dec. 6, 1966, Ser. No. 600,347, now Patent No. 3,420,817, dated Jan. 7, 1969, which is a continuation-in-part of application Ser. No. 522,397, Jan. 24, 1966. Divided and this application Oct. 17, 1968, Ser. No. 768,514
Int. Cl. C07c *103/42*
U.S. Cl. 260—562 N **11 Claims**

2-Aminoxy-2'-acyl-acetanilides and N - (2 - amino - X-phenylmethylene)aminoxyacetic acid lower alkyl esters (X=phenyl, alkyl and cycloalkyl) and substituted derivatives thereof. These compounds are intermediates in the preparation of 4,1,5-benzoxadiazocines (A) and known 1,4-benzodiazepines (B). A and B are useful as sedatives, muscle relaxants and anticonvulsant agents. A is also useful as intermediates in the preparation of B.

3,657,345
ISOMER ENRICHMENT OF 1,4-CYCLOHEXANEDIAMINE

Loren D. Brake, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 27, 1969, Ser. No. 869,501
Int. Cl. C07c *85/16*
U.S. Cl. 260—563 R **18 Claims**

A mixture of the stereoisomers of 1,4-cyclohexanediamine not at equilibrium is converted to a mixture of stereoisomers approaching the equilibrium ratio by heating the mixture of stereoisomers to a temperature of from 150° to 300° C. in the presence of hydrogen at a pressure of from 50 to 5,500 pounds per square inch and a total pressure of from 500 to 15,000 pounds per square inch, in the presence of from 0% to 200% by weight, based on the weight of diamine, of added ammonia, and in the presence of from 0.001% to 10% by weight, based on the weight of diamine and calculated as metallic ruthenium, of a ruthenium catalyst supported on an inert carrier, said catalyst being alkali moderated with from 0.05% to 15% of a basic alkali metal compound calculated as the alkali metal. Either essentially pure trans-1,4-cyclohexanediamine or enriched cis-1,4-cyclohexanediamine can be recovered.

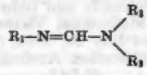
3,657,346

N,N-DIMETHYL-N'-(2,5-DIMETHYLBENZYL) FORMAMIDINE

Dieter Duerr, Bottmingen, and Heinz Siegle, Binningen, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed Jan. 17, 1968, Ser. No. 698,445
Claims priority, application Switzerland, Jan. 26, 1967, 1,187/67
Int. Cl. C07c *23/00*
U.S. Cl. 260—564 R 1 Claim

The present invention relates to a new amidine of the formula



or an acid addition salt thereof, wherein R_1 represents an aliphatic, cycloaliphatic, cycloaliphatic-aliphatic or araliphatic radical, R_2 represents a hydrogen atom or a lower aliphatic radical and R_3 represents a lower aliphatic radical, or wherein R_2 and R_3 together with the nitrogen atom to which they are bonded represent a 5-membered to 7-membered heterocyclic structure optionally containing further hetero-atoms as well as to pesticidal preparations, which contain, as active ingredient, an amidine as defined above.

3,657,347

PRODUCTION OF LONG CHAIN AMINES BY REACTING MONOETHANOLAMINE, MONOISOPROPANOLAMINE AND/OR ETHYLENEDIAMINE WITH LONG CHAIN STRAIGHT CHAIN SECONDARY CHLORIDES

Thomas C. Muller, East Orange, Lawrence B. Nelson, Franklin Lakes, and Bernard R. Bluestein, Glen Rock, N.J., assignors to Witco Chemical Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 673,917, Oct. 9, 1967. This application June 17, 1970, Ser. No. 47,139
Int. Cl. C07c *85/04*
U.S. Cl. 260—583 P 4 Claims

Production of long chain amines, in a form substantially free from olefins, by reacting (a) monoethanolamine, N-methylethanolamine, monoisopropanolamine, and/or ethylenediamine with (b) secondary monochlorinated straight chain paraffin hydrocarbons containing from 6 to 26 carbon atoms, particularly those prepared by partially chlorinating a petroleum derived hydrocarbon fraction consisting essentially of C_8 to C_{18} straight chain paraffins to the extent whereby from about 10 to about 25 mol percent of the paraffins are monochlorinated, said fraction being largely free from branched chain hydrocarbons and from chlorinated branched chain hydrocarbons.

3,657,348

DISUBSTITUTED CYCLOPROPENONES AND METHOD OF PRODUCTION

Stephen W. Tobey, Sudbury, Mass., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed May 3, 1968, Ser. No. 726,549
Int. Cl. C07c *49/44*
U.S. Cl. 260—586 R 5 Claims

New disubstituted cyclopropenones and a new method of preparing said cyclopropenones comprising reacting a halocyclopropenium Lewis acid salt with a substituted olefin containing a carbon to carbon double bond wherein one terminal carbon atom of the double bond is sterically accessible to attack by the cyclopropenium ion, and the other terminal carbon atom of the double bond bears substituents contributing to the formation of a stable carbonium ion.

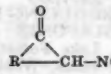
3,657,349

METHOD OF PREPARING NITROCYCLOALKANONE

Donald R. Lachowicz, Todd S. Simmons, and Kenneth L. Kreuz, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Application Mar. 10, 1966, Ser. No. 541,431, now Patent No. 3,466,326, which is a continuation-in-part of application Ser. No. 466,816, June 24, 1965, now Patent No. 3,415,856. Divided and this application Feb. 19, 1969, Ser. No. 831,794
Int. Cl. C07c *45/00*
U.S. Cl. 260—586 R 3 Claims

Method of preparing a nitrocycloalkanone of the formula:



where R is polymethylene or substituted polymethylene comprising contacting a cycloalkene with dinitrogen tetroxide and oxygen to form a peroxy nitrate compound subsequently contacting said peroxy nitrate compound with a denitrating agent.

3,657,350

PROCESS AND COMPOSITIONS

Aram Mooradian, Schodack, and Paul E. Dupont, Colonie, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Original application May 9, 1967, Ser. No. 637,093, now Patent No. 3,547,997, dated Dec. 15, 1970. Divided and this application Mar. 2, 1970, Ser. No. 15,869
Int. Cl. C07c *49/28*
U.S. Cl. 260—590 1 Claim

2-(2-iminoalkyl)-phenols are prepared by a novel rearrangement process of reacting in the approximate range of 20 to 40° C. an O-phenyl ketoxime with a strong acid in a non-aqueous medium. The novel 2-(2-imino-alkyl)-phenols have antibacterial properties and are readily hydrolyzed to the corresponding 2-(2-keto-alkyl)-phenols which are useful as intermediates for the preparation of benzofuran derivatives.

3,657,351

PROCESS FOR THE PREPARATION OF 2,6,8-TRIMETHYL-4-NONANONE

Michio Araki, Tokyo, Hiroshi Uchida, Ichinomiya-shi, and Yoshihide Kotera, Kawasaki-shi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

No Drawing. Filed Sept. 27, 1968, Ser. No. 763,347
Claims priority, application Japan, Sept. 30, 1967, 42/62,694
Int. Cl. C07c *45/16*
U.S. Cl. 260—593 R 2 Claims

A process of preparing 2,6,8-trimethyl-4-nonanone which comprises passing a secondary alcohol or a mixture thereof with the corresponding ketone through a binary catalyst prepared from chromium oxide and copper oxide or a ternary catalyst prepared from chromium oxide, copper oxide and zinc oxide at from about 200° C. to about 350° C.

3,657,352

PROCESS FOR THE PREPARATION OF TERTIARY PHOSPHINE OXIDES

Hans-Jerg Kleiner, Bad Soden, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Mar. 4, 1970, Ser. No. 16,612
Int. Cl. C07f *9/50*
U.S. Cl. 260—606.5 P 7 Claims

Improved process for the preparation of tertiary phosphine oxides by reacting dialkyl phosphine oxides with

α-olefins wherein the reaction is carried out under an atmosphere of an inert gas with exposure to ultraviolet light, in the presence of catalytical amounts of free radical-forming agents or in the absence of these catalytical measures at a temperature between 130° and 200° C.

In comparison to known processes the tertiary phosphine oxides are obtained within a shorter reaction time, with higher purity and in higher yields. The reaction products can be used as intermediates, surfactants, detergents and cleaning agents, especially in cosmetic products.

3,657,353

PROCESS FOR PRODUCING IODOMETHYL SULFONES

Aldo Joseph Crovetti, Lake Forest, and Richard Paul Germann and Artur Blank, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed July 25, 1969, Ser. No. 845,097
Int. Cl. C07c *147/06*
U.S. Cl. 260—607 A **8 Claims**

Iodination with iodine and chlorine in a reaction mixture buffered to a weakly acidic pH produces a superior conversion based on both the iodine and the iodinated compound. Preparation of iodomethylsulfones from substituted sulfonyl acetic acids is illustrated.

3,657,354

PROCESS FOR PREPARING ALCOHOLS AND ALDEHYDES FROM OLEFINS

Friedrich Asinger, Aachen, Germany, assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed Apr. 15, 1968, Ser. No. 721,201
Int. Cl. C07c *45/02*
U.S. Cl. 260—604 R **26 Claims**

A process is described for preparing alcohols and aldehydes, by reacting olefins, carbon monoxide and water using a rhodium or iridium oxide or sulfide as the catalyst in the presence of an alkanol or tertiary amine solvent. The reaction is carried out at elevated temperatures (to about 300° C.) and under pressures above atmospheric (to 500 atmospheres).

The alcohols and aldehydes produced contain one carbon atom more than the starting olefin; they are especially useful as solvents and intermediates for the preparation of carboxylic acids, for example.

3,657,355

PRODUCTION OF 2-NITROCHLOROBENZENES

Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Oct. 9, 1970, Ser. No. 79,620
Int. Cl. C07c *149/34, 79/12*
U.S. Cl. 260—609 E **11 Claims**

2-nitrochlorobenzenes are prepared by reacting certain 4-substituted 2-nitrophenols with phosgene in an inert solvent in the presence of a catalytic amount of a dialkylformamide, thus replacing the hydroxy group with chlorine.

3,657,356

STABILIZED ETHER COMPOSITIONS

Patricia Lucille Hudgins, South Charleston, W. Va., George Raymond Stringer, Somerville, N.J., and William Herald Swango, St. Albans, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,850
Int. Cl. C07c *41/04*
U.S. Cl. 260—611.5 **8 Claims**

Organic mono and poly ethers are inhibited against peroxide formation by the addition thereto of trace amounts of a tetraalkyl thiuram disulfide. Illustrative ethers are diethyl ether, the monoethyl ethers of ethylene glycol or triethylene glycol, methoxyethyl acetate, dioxane, 1,3-dioxolane, di(butoxyethyl) phthalate, useful inhibitors are tetramethyl thiuram disulfide, tetradecyl thiuram disulfide, dimethyl dibutyl thiuram disulfide. The ethers are known compounds having established uses.

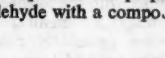
3,657,357

INSECTICIDAL COMPOUNDS AND METHODS FOR THEIR PREPARATION

George Holan, Brighton, Victoria, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, East Melbourne, Victoria, Australia

No Drawing. Filed July 17, 1969, Ser. No. 842,735
Claims priority, application Australia, July 17, 1969, 40,745
Int. Cl. C07c *43/20*
U.S. Cl. 260—613 R **5 Claims**

New insecticides comprising 1,1-bis (p-ethoxyphenyl)-2-nitropropane; 1,1-bis (p-ethoxyphenyl)-2-nitro-n-butane and 1,1 - bis (p - ethoxyphenyl)-2-methyl-2-nitropropane. These compounds are prepared by condensing p-ethoxybenzaldehyde with a compound having the formula



wherein one of the groups R^1 and R^2 is methyl and the other is hydrogen or methyl, and reacting the carbinol product with phenetole.

3,657,358

COMPOUNDS 2,4 - DICHLORO - 3 - METHOXY-6-NITROPHENOL, 2,6-DICHLORO - 3 - METHOXY-4-NITROPHENOL AND THEIR ALKALI METAL SALTS

Earl G. Alley and Richard Garth Pews, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Aug. 14, 1969, Ser. No. 850,214
Int. Cl. C07c *43/28*
U.S. Cl. 260—613 D **4 Claims**

The new compounds 2,4-dichloro-3-methoxy-6-nitrophenol, 2,6-dichloro-3-methoxy-4-nitrophenol and their alkali metal salts are prepared by alkali hydrolysis in aqueous methanol of 2,3,4,5-tetrachloronitrobenzene. These compounds have been discovered to be active herbicides, fungicides and insecticides.

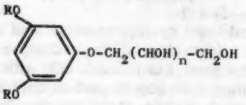
3,657,359

DERIVATIVES OF PHLOROGLUCINOL

Madeleine Vaille, born Penciolelli, Brunoy, France, assignor to Societe Anonyme dite: Orsymonde, Paris, France

No Drawing. Filed Aug. 29, 1969, Ser. No. 854,264
Claims priority, application Great Britain, Sept. 4, 1968, 42,137/68
Int. Cl. C07c *43/22*
U.S. Cl. 260—613 D **2 Claims**

This invention is concerned with phloroglucinol derivatives which are represented by the formula:



wherein R is a lower alkyl group and *n* is 0 or 1 . These compounds having interesting pharmacological properties are obtained by reacting 3,5-dialkoxy-phenol with either glycol chlorhydrin or glycerol chlorhydrin.

3,657,360

RECOVERY OF HYDROXYALKYL VINYL ETHERS

Frank Carluccio, Easton, Pa., and Max Eugene Chiddix, League City, Tex., assignors to GAF Corporation, New York, N.Y.

No Drawing. Filed June 12, 1970, Ser. No. 45,919
Int. Cl. C07c 41/12
U.S. Cl. 260—615 R 7 Claims

Hydroxyalkyl vinyl ethers are recovered in good yield and high purity from crude mixtures thereof which contain an alkali metal hydroxide, such as the reaction product produced by the partial vinylation of an alkylene glycol with acetylene in the presence of an alkali metal hydroxide, by converting the alkali metal or alkaline earth metal hydroxide in the crude material to an alkali metal carbonate, as by the addition to the crude material of an alkali metal acid carbonate or carbon dioxide, and distilling the crude material containing an alkali metal carbonate but essentially free of alkali metal hydroxide.

3,657,361

PREPARATION OF MAGNESIUM ALCOHOLATES

Arnold Lenz, Stammheim, Otto Bleh, Bergheim, and Erich Termin, Niederkassel, Germany, assignors to Dynamit Nobel Aktiengesellschaft

No Drawing. Filed Oct. 30, 1969, Ser. No. 872,751
Claims priority, application Germany, Nov. 2, 1968, P 18 06 549.1
Int. Cl. C07c 31/30, 43/04
U.S. Cl. 260—615 R 5 Claims

Compounds of the formula $Mg(OR)_2 \cdot (ROH)_n$ are prepared by first pretreating the alcohol, ROH, with the orthoformic acid ester of that alcohol, and then reacting metallic magnesium with the pretreated alcohol. p-Toluenesulfonic acid may additionally be used to pretreat the alcohol.

3,657,362

PROCESS FOR PREPARING α,ω-BIS (FLUOROPERHALOISOPROPOXY) PERFLUOROALKANES

John P. Sibilia, Livingston, and Cyril Woolf and John Frank, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 17, 1969, Ser. No. 885,776
Int. Cl. C07c 41/00
U.S. Cl. 260—615 R 7 Claims

α,ω - Bis(fluoroperhaloisopropoxy) perfluoroalkanes useful as dielectric coolants are prepared by the pyrolytic dimerization of α-(fluoroperhaloisopropoxy)-ω-iodoperfluoroalkanes.

3,657,363

PROCESS FOR THE DEUTERATION OF THE HYDROXYL POSITION OF ORGANIC ALCOHOLS

Ernest A. Dorko, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army

No Drawing. Filed Sept. 15, 1967, Ser. No. 668,245
Int. Cl. C07c 31/12, 13/04
U.S. Cl. 260—642 1 Claim

A novel process for the preparation of organic alcohols in which the hydroxyl position contains a deuterium atom. The process involves adding a quantity of the alkali metal salt of an organoic alcohol (i.e., t-butyl alcohol) in small portions to a three-fold molar amount of deuterium oxide. The reaction mixture is stirred vigorously during the addition. The resulting mixture of deuterated alcohol, potassium deuteroxide and deuterium oxide (heavy water) is distilled. The appropriate alcohol fraction is separated in the distillation process and final traces of heavy water and water from the atmosphere are removed by passage of the fraction through barium oxide. The process represents a great simplification of the previous process.

3,657,364

PROCESS FOR SEPARATING NITROPARAFFINS

Wheeler C. Crawford and John A. Patterson, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.

No Drawing. Filed Jan. 30, 1970, Ser. No. 7,269
Int. Cl. C07c 79/14
U.S. Cl. 260—644 12 Claims

This invention relates to a process for selectively separating nitroparaffins from paraffins and from other contaminants of a nitration reaction mixture using a solvent system comprising aprotic solvents and water.

3,657,365

PROCESS FOR THE MANUFACTURE OF METHYL OR ETHYL CHLORIDE FROM METHYL OR ETHYL ACETATE

Hans Fernholz, Fischbach, Taunus, and Heinz Wendt, Sulzbach, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Apr. 13, 1970, Ser. No. 28,151
Claims priority, application Germany, Apr. 18, 1969, P 19 19 725.2
Int. Cl. C07c 19/02
U.S. Cl. 260—652 R 4 Claims

The subject of the invention is a process for the manufacture of methyl or ethyl chloride from methyl or ethyl acetate by a reaction with hydrogen chloride in the vapor phase at temperatures within the range of from 120° to 360° C. and under pressures of from 0 to 20 atmospheres gauge, using as catalyst technically pure silicic acid which was impregnated with from 5 to 15% by weight of zinc chloride. The silicic acid should have a specific surface of from 20 to 800 $m.^2$ per gram and an average pore diameter of from 5 to 2,000 A.

3,657,366

AGENT FOR PREVENTING ISOMERIZATION OF DICHLOROBUTENE

Ryuichi Kobayashi, Takao Iwasaki, Junji Hirano, and Hideki Matsumura, Ohmi-machi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 752,473, Aug. 14, 1968. This application Aug. 24, 1970, Ser. No. 66,612
Int. Cl. C07c 17/42
U.S. Cl. 260—652.5 R 1 Claim

3,4-dichlorobutene-1 and 1,4-dichlorobutene-2 are useful intermediates in chemical industry. However, 3,4-dichlorobutene-1 and 1,4-dichlorobutene-2 are isomerized into one another during the storage or in such a step as distillation and an undesirable isomer is increased. Such an undesirable isomerization is prevented by adding an ammonium salt of a carboxylic acid as a stabilizer.

3,657,367

OXYCHLORINATION OF SATURATED AND UNSATURATED HYDROCARBONS IN THE PRESENCE OF A FLUIDIZED CATALYST CONTAINING LANTHANUM AND DIDYMIUM

Robert J. Blake, Oakland, and Guy W. Roy, Richmond, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Oct. 31, 1968, Ser. No. 772,395
Int. Cl. C07c 17/00, 17/02
U.S. Cl. 260—659 A 4 Claims

Catalyst compositions comprising mixtures of salts of copper, potassium, didymium, lanthanum and magnesium are useful in the fluidized bed oxychlorination of aliphatic hydrocarbons. The catalyst composition loading is disposed on a suitable support media, preferably an alumina and does not cake or cause defluidization of the bed under start-up, operating, or shut-down conditions.

3,657,368

CATALYSIS BY DISPERSIONS OF METAL HALIDES IN MOLTEN TRIHALOSTANNATE(II) AND TRIHALOGERMANATE(II) SALTS

George W. Parshall, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Division and a continuation-in-part of application Ser. No. 727,710, May 8, 1968. Divided and this application Nov. 24, 1970, Ser. No. 92,541

Int. Cl. C07c *5/14, 5/16*

U.S. Cl. 260—666 A 10 Claims

Dispersions of transition and other metal halides in molten tetrahydrocarbylammonium or phosphonium trihalostannate(II) and trihalogermanate(II) salts are useful as catalysts for the hydrogenation, isomerization or carbonylation of olefins and the hydrogenation of nitriles.

3,657,369

OLIGIMERIZATION OF ISOBUTENE AND α-METHYLSTYRENE

Gary L. Driscoll, Boothwyn, Pa., and David L. Kerr, Wilmington, Del., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed July 6, 1970, Ser. No. 52,773

Int. Cl. C07c *15/10*

U.S. Cl. 260—669 P 6 Claims

Simultaneously or successively polymerizing of isobutene to form a polyisobutene having a viscosity index of from 95–130, and α-methylstyrene, using stannic chloride as the catalyst and nitromethane as the solvent at from −30 to 200° C. and preferably from 0° C. to 50° C. The stannic chloride is present in from 0.5 to 40 and preferably 1 to 20 volume percent as based on the nitromethane present.

3,657,370

PROCESS FOR THE PREPARATION OF DI-TERTIARY-AROMATIC HYDROCARBONS

William C. Hammann, Creve Coeur, and Charles F. Hobbs, Des Peres, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Jan. 2, 1970, Ser. No. 433

Int. Cl. C07c *3/56*

U.S. Cl. 260—671 R 10 Claims

Di-t-alkyl aromatics are obtained in good yield and in preference to secondary isomers by alkylating benzene or naphthalene with an olefin or a t-alkyl halide using $FeBr_3$ as a catalyst. Compounds having t-alkyl groups of 8 to 28 carbon atoms which are useful as oxidatively stable functional fluids are prepared by this process.

3,657,371

PROCESS FOR PREPARING ALKYLBENZENES

Benedetto Calcagno, Milan, Marcello Ghirga, Bresso, and Natale Ferlazzo, Milan, Italy, assignors to Società Italiana Resine S.p.A., Milan, Italy

No Drawing. Filed July 8, 1969, Ser. No. 840,020

Claims priority, application Italy, July 15, 1968, 18,978/68, Patent 839,022

Int. Cl. C07c *3/56*

U.S. Cl. 260—671 B 7 Claims

A conventional process for preparing alkylbenzenes is carried out, wherein linear C_9–C_{15} paraffins are chlorinated and catalytically alkylated with excess benzene, fractionated, and unreacted paraffins and benzene are recycled. According to the invention, by-products, especially chlorinated products, are removed from the unreacted paraffins by contacting the paraffins, prior to recycle, with concentrated sulphuric acid, oleum or sulphuric anhydride.

3,657,372

NAPHTHALENE CRYSTAL GROWTH IN A GEL

John C. Murphy, Ellicott City, and Henry A. Kues, Jr., Carney, Md., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Mar. 10, 1969, Ser. No. 805,893

Int. Cl. B01d *9/02;* C07c *15/24*

U.S. Cl. 260—674 A 1 Claim

A method for crystal growth in a diffusion medium is disclosed which utilizes a "co-solute effect" to produce single crystals of a material of interest. Generally, a co-solute is a material soluble in the chosen solvent medium and which increases the solubility in said solvent medium of some material of interest. To practice the invention as taught herein, a co-solute is used which increases the solubility of the material of interest with concentration of the co-solute.

3,657,373

PROCESS FOR THE PREPARATION OF OLEFINS USING CARBONYL COMPOUNDS AND SILYL-SUBSTITUTED ORGANOMETALLIC COMPOUNDS

Donald J. Peterson, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Original application Dec. 26, 1967, Ser. No. 693,084, now Patent No. 3,517,042, dated June 23, 1970. Divided and this application Apr. 2, 1970, Ser. No. 25,269

Int. Cl. C07c *11/02*

U.S. Cl. 260—677 2 Claims

A process for the conversion of carbonyl compounds to the corresponding olefins using trialkylsilyl-organometallic compounds.

3,657,374

RECOVERY OF ISOBUTYLENE FROM MIXTURES CONTAINING THE SAME AND BUTADIENE

Karl Schloemer, Ludwigshafen, Otto Nagel, Hambach, Rolf Platz, Mannheim, and Hans Martin Weitz, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 26, 1970, Ser. No. 14,528

Claims priority, application Germany, Mar. 1, 1969, P 19 10 473.5

Int. Cl. C07c *11/24*

U.S. Cl. 260—677 A 6 Claims

Recovery of isobutylene from mixtures of C_4-hydrocarbons by absorption in a mixture of tert-butanol, sulfuric acid and water, recovery of tert-butanol by heating the aqueous solution of tert-butanol in sulfuric acid as an azeotrope with 12% water, fractionation of the said azeotrope and decomposition of the tert-butanol by passing it over alumina at about 300° C.

3,657,375

PRODUCTION OF ACETYLENE

Erwin Brunner, Ludwigshafen, Rolf Platz, Mannheim, and Kurt Taglieber and Kurt Weinfurter, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 16, 1970, Ser. No. 11,390

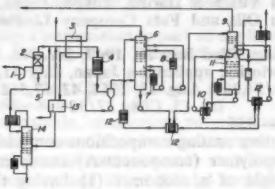
Claims priority, application Germany, Feb. 21, 1969, P 19 08 619.2

Int. Cl. C07c *11/24*

U.S. Cl. 260—679 A 2 Claims

Production of pure acetylene from cracked gas, obtained by cracking liquid hydrocarbons by, in particular, the sub-

merged-flame process, by combining a number of process stages, in which the C_3 to C_5 hydrocarbons contained in



the crude acetylene are washed out with an organic solvent such as toluene.

3,657,376
PRODUCTION OF ISOPRENE
Adolf Stuebinger and Herbert Mueller, Frankenthal, and Hermann Overwien, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed June 3, 1970, Ser. No. 43,244
Claims priority, application Germany, June 6, 1969, P 19 28 632.9
Int. Cl. C07c *1/00, 1/24*
U.S. Cl. 260—681 **3 Claims**

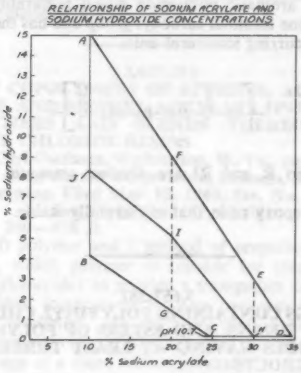
Process for the manufacture of isoprene by catalytic dehydration of 3-methyl-3-buten-1-ol in the presence of calcium phosphate as catalyst at elevated temperatures, wherein dehydration is carried out, preferably in the presence of steam, at temperatures between 200° and 300° C. using a 3-methyl-3-buten-1-ol having a purity of at least 85% by weight based on the total weight of oxygen-containing organic compounds present in the starting material. Isoprene is an important monomer, for example in the production of synthetic rubber.

3,657,377
JET FUEL PRODUCTION
Jacob D. Kemp, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed Jan. 19, 1970, Ser. No. 4,054
Int. Cl. C07c *3/56*
U.S. Cl. 260—683.48 **1 Claim**

An alkylation process for producing jet fuel from hydrocarbons which comprises (a) contacting an isoparaffin feedstock with an olefin feedstock in the presence of hydrofluoric acid at a temperature between about 30° and 100° F. in a reaction zone, (b) maintaining the ratio of isoparaffin to olefin below 2.0 in said reaction zone, and (c) withdrawing from said reaction zone an effluent containing at least 10 weight percent hydrocarbon boiling between about 300° and 550° F., exclusive of any acid oil produced in said reaction zone.

3,657,378
PREPARING POLYACRYLATES
Henry Volk, Bay City, and Percy Jay Hamlin, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Filed Jan. 14, 1969, Ser. No. 790,988
Int. Cl. C08f *3/44, 15/00, 15/36*
U.S. Cl. 260—80 L **12 Claims**

Polyacrylates are prepared in aqueous solution under specially controlled reaction conditions to produce efficient flocculants. Alkali metal acrylate is polymerized at a monomer concentration within the range from about 10 weight percent of the polymerization system up to the monomer saturation level. The monomer solution is adjusted to a pH of at least about 10.7 by the addition of an alkali metal hydroxide. The upper limit on the amount of hydroxide that can be employed will range downwardly from about 15 weight percent of the polymerization system to less than 1 percent for monomer concentrations



from 10 weight percent up to the monomer saturation level. Further improvement in polymer properties is achieved by the incorporation of at least about 1 weight percent, based on the weight of polymerization system, of an alkali metal salt.

3,657,379
INTERCROSSING RESIN/CURING AGENT ADHESIVE SYSTEMS
Ronald D. Hilbelink, Dayton, and Gavin H. Peters, Lebanon, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
No Drawing. Original application July 8, 1969, Ser. No. 840,060. Divided and this application July 2, 1970, Ser. No. 60,962
Int. Cl. C08g *39/10, 45/06, 47/10*
U.S. Cl. 260—824 R **2 Claims**

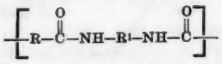
Novel adhesive systems are disclosed which pertain to combinations of more than one curable resin and the curing agents corresponding thereto. The disclosed adhesive systems comprise separated reactive components wherein: (a) a first reactive polymeric material is combined with a curing agent for a second reactive polymeric material to yield one component and; (b) the second reactive polymeric material is combined with a curing agent for the first reactive polymeric material to form another component. Several embodiments relating to intercrossing combinations of the two components are disclosed. In all of the embodiments, when the reactive materials from two components are combined, the curing agents react with their respective, intercrossed, reactive polymeric material to yield strong adhesive bonds. Of particular interest in this invention are embodiments of the adhesive systems which pertain to a rapidly curing adhesive and especially to such an adhesive for use underwater.

3,657,380
HIGH TEMPERATURE RESISTANT COATING COMPOSITION OF AN AROMATIC POLYAMIDE AND AN EPOXY RESIN
James C. Fang, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Dec. 9, 1969, Ser. No. 883,646
Int. Cl. C08g *45/08, 45/10, 45/12*
U.S. Cl. 260—831 **3 Claims**

A coating composition that is resistant to high temperatures and is particularly useful as a temperature

resistant coating for metals, as a wire enamel, as an impregnant for forming circuit boards and as a high temperature adhesive is the subject of this invention. The coating composition contains as the film-forming constituents:

(A) an aromatic polyamide which preferably has at least one terminal carboxyl group and has the following recurring structural unit:



wherein R and R^1 are divalent aromatic radicals; and

(B) an epoxy resin that is thermally stable.

3,657,381

COATINGS CONTAINING POLYVINYL CHLORIDE, EPOXY RESINS, AND ESTERS OF POLYHYDRIC ALCOHOLS HAVING AT LEAST THREE ACRYLATE GROUPS

Rene Speitel, Rheinfelden, and Max R. Hegnauer, Im Steinacker, Aesch, Switzerland, assignors to Arfa Rohrenwerke A.G., Basel, Switzerland

No Drawing. Filed Mar. 26, 1970, Ser. No. 23,070
Claims priority, application Switzerland, Nov. 20, 1969, 17,313/69
Int. Cl. C08g *45/04*
U.S. Cl. 260—836 **7 Claims**

A method of producing a strongly adherent, corrosion-resistant coating on a substrate by applying to the substrate a composition having a polyvinyl chloride base and containing (a) 5–20% by weight of the polyvinyl chloride of at least one solid and/or liquid precondensate of epichlorohydrin and bis-phenol, and (b) at least one ethylenically unsaturated cross-linking monomer selected from esters of polyalcohols containing more than two acrylic or methacrylic acid residues, the proportion of component (b) to component (a) being 2–5.1. Also provided are the compositions used as coating material in such method.

3,657,382

PROCESSING AID FOR ABS RESINS

Adam Frank Kopacki, Westwood, N.J., assignor to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed July 1, 1970, Ser. No. 51,716
Int. Cl. C08f *19/08, 15/40, 29/22*
U.S. Cl. 260—836 **8 Claims**

There is disclosed an improved ABS, i.e. acrylonitrile-butadiene-styrene, resin composition having improved processing characteristics as a result of the incorporation therein of a processing aid comprising a plurality of particles of polyacrylate-modified polyvinyl chloride.

3,657,383

PRINTING PLATE COMPOSITIONS

Julius L. Silver, Manchester, Conn., assignor to Union Carbide Corporation

No Drawing. Original application Dec. 9, 1963, Ser. No. 329,247. Divided and this application Nov. 12, 1970, Ser. No. 89,113
Int. Cl. C08g *37/18*; G03c *1/72*
U.S. Cl. 260—838 **9 Claims**

A printing plate base composition of (1) an association product of a normally water soluble ethylene oxide polymer and a heat fusible phenolic resin, and (2) 2 to 50 percent by weight of an oxidizing acidic compound based on the weight of the phenolic resin.

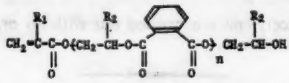
3,657,384

THERMOSETTING COATING COMPOSITIONS

Toyohiko Yoshida and Shinichi Wako, Yokohama, Masamitsu Koshimura, Fujisawa, Junichi Matsuzaka, Yokohama, and Yukinori Haruta, Tokyo, Japan, assignors to Nippon Oils and Fats Company Limited, Tokyo, Japan

No Drawing. Filed July 28, 1969, Ser. No. 845,506
Claims priority, application Japan, July 31, 1968, 43/54,208; Aug. 13, 1968, 43/57,568
Int. Cl. C08g *37/32*
U.S. Cl. 260—856 **3 Claims**

Thermosetting coating compositions comprising a thermoplastic copolymer (component A) consisting of 15 to 99% by weight of a monomer (I) having the general formula



wherein R_1 is hydrogen, methyl or ethyl, R_2 is hydrogen, methyl or the combination of hydrogen and methyl and n is 1 to 3, 1 to 20% by weight of an α,β-monoethylenically unsaturated carboxylic acid (monomer (II)) of acrylic acid, methacrylic acid, itaconic acid or crotonic acid and 0 to 89% by weight of an α,β-monoethylenically unsaturated compound (monomer (III)), copolymerizable with the monomers (I) and (II) and an alkylated aminoplast (component (B) which is a condensate of a compound having one or more triazine rings in one molecule, formaldehyde and a saturated monohydric alcohol having 1 to 6 carbon atoms, a mixture ratio of the component (A) to the component (B) being from 60/40 to 90/10.

3,657,385

LACTAM BLOCK COPOLYMERS

Markus Matzner, Edison, and James E. McGrath, Somerville, N.J., assignors to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Oct. 12, 1970, Ser. No. 80,221
Int. Cl. C08g *41/04, 20/00*
U.S. Cl. 260—857 R **13 Claims**

Block copolymers are prepared from lactam monomers and polyarylene polyethers. The polymers are prepared in a lactam anionic polymerization reaction using an alkaline catalyst and a polyarylene polyether as an activator or initiator.

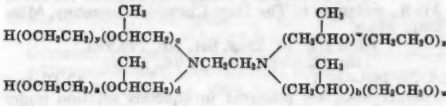
3,657,386

ANTISTATIC POLYAMIDE FIBER CONTAINING POLYETHER

Gene C. Weedon, Richmond, and Lamberto Crescentini, Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Apr. 30, 1970, Ser. No. 33,530
Int. Cl. C08g *41/04*
U.S. Cl. 260—857 PE **8 Claims**

It has been found that an antistatic fiber of polyamide, polyester, polyurea, polyurethane or polysulfonamide can be prepared by uniformly dispersing between about 1 percent and about 12 percent by weight of a compound represented by the formula:



where a, b, c, d, w, x, y, and z are each a whole number and the total of a, b, c, and d is between 8 and 850 and the total of w, x, y, and z is between 8 and 1,000. The compound has a molecular weight between about 4,000 and 135,000 and the ethylene oxide moiety makes up 10 to 90% of the molecular weight of the compound.

3,657,387

POLYESTER RESIN COMPOSITION WITH A LONG SHELF LIFE

Eldon E. Stahly, Ellicott City, and Edwin W. Lard, Bowie, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 782,735, Dec. 10, 1968. This application Apr. 29, 1970, Ser. No. 33,047

Int. Cl. C08f *21/02, 45/58*

U.S. Cl. 260—866 10 Claims

Uncured, curable, unsaturated polyester resin compositions consisting essentially of an unsaturated polyester, an ethylenically unsaturated monomer such as styrene or a similar monomer, and about 0.1–1.5 mole percent of an inhibitor selected from a group consisting of tetrachlorocatechol, tetrachlorohydroquinone, tetrabromocatechol, and tetrabromohydroquinone have shelf lives in excess of about 100 days at about 70° C.

3,657,388

PROCESS FOR THE CONDENSATION IN THE SOLID STATE OF CONDENSATION POLYMERS OR THE INITIAL PRODUCTS THEREOF

Peter Schweizer, Konigsbrunn, and Hans Thaler, Strassberg, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Apr. 16, 1970, Ser. No. 29,284

Claims priority, application Germany, Apr. 26, 1969, P 19 21 447.2

Int. Cl. C08g *17/003, 39/10*

U.S. Cl. 260—873 5 Claims

Linear condensation polymers of high molecular weight, for example, polyesters or polyamides, or the initial products thereof are condensed in the solid state in the form of pressed objects obtained from the powdery or very fine-grained materials having a particle diameter of up to 2 millimeters. The condensation in the solid state is carried out under reduced pressure or in an inert gas atmosphere. The process is applicable, for example, to polyethylene terephthalate, Nylon 6 and Nylon 66.

3,657,389

HOT-MELT ADHESIVE POLYMER BLENDS

John R. Caldwell and Winston J. Jackson, Jr., Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 671,940, Oct. 2, 1967. This application Feb. 12, 1970. Ser. No. 11,033

Int. Cl. C08g *39/10*

U.S. Cl. 260—873 5 Claims

Improved hot-melt adhesives comprising polyesters blended with polyolefins or vinyl polymers and articles secured therewith. The polyesters of 1,4-butanediol and terephthalic or trans-1,4-cyclohexane dicarboxylic acid, blended with polystyrene are preferred adhesive compositions.

3,657,390

POLYVINYL CHLORIDE RESIN COMPOSITION OF IMPROVED TRANSPARENCY AND IMPACT RESISTANCE AND PREPARATION THEREFOR

Takashi Tanaka and Haruhiko Yusa, Fukushima-ken, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Chuo-ku, Tokyo-to, Japan

Filed Sept. 2, 1969, Ser. No. 854,402

Claims priority, application Japan, Aug. 31, 1968, 43/62,631

Int. Cl. C08f *29/24, 29/50, 29/56*

U.S. Cl. 260—876 R 6 Claims

Polyvinyl chloride resin composition having excellent transparency and impact resistance prepared by mixing polyvinyl chloride resin with at least two kinds of graft-copolymers of butadiene-styrene-acrylic monomers, the one having a higher refractive index than that of the polyvinyl chloride and the other having a lower refractive index than that of the polyvinyl chloride, both graft-polymers being mixed at varying proportions depending on the kind and quantity of additive assistants.

3,657,391

GRAFT COPOLYMERS OF STYRENE, ACRYLONITRILE AND METHYL ACRYLATE ONTO DIENE POLYMERS AND BLENDS THEREOF WITH VINYL CHLORIDE RESINS

Don Carl Curfman, Washington, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

No Drawing. Filed Mar. 12, 1969, Ser. No. 806,675

Int. Cl. C08f *41/12, 19/08*

U.S. Cl. 260—876 R 3 Claims

A graft polymer and a method of preparing the graft polymer, which polymer is suitable for blending with poly(vinylchloride) to provide a transparent composition that exhibits transparency and an optimum balance of physical properties. The graft polymer is prepared by polymerizing styrene, acrylonitrile and methyl acrylate in the presence of a diene rubber substrate.

3,657,392

POLYETHYLENE GRAFTS OF HOMO- AND COPOLYMERS OF N-VINYL AMIDES

Wiley E. Daniels, Easton, and Nathan D. Field, Allentown, Pa., and Leon Katz, Springfield, N.J., assignors to General Aniline & Film Corporation, New York, N.Y.

No Drawing. Filed July 11, 1967, Ser. No. 652,432

Int. Cl. C08f *15/00*

U.S. Cl. 260—878 R 10 Claims

Polyethylene is grafted onto homopolymers and copolymers of N-vinyl amides by polymerizing ethylene in the presence of such homopolymers and copolymers in the presence of free radical catalyst at a temperature of from 0° to 300° C., preferably at 30° C. to 200° C., and a pressure of about 3,000 to 50,000 p.s.i.g. During this polymerization the ethylene becomes affixed to the backbone of said homo- and copolymers as one or more pendant long poly(ethylene) chains. The resulting products consist essentially of at least two polyethylene chains, each having an average molecular weight of at least 5,000, grafted onto a polymer backbone selected from the group consisting of homopolymers and copolymers of N-vinyl amides having relatively high tensile strength which can be cast into flexible films, and which can be blended with polypropylene for the preparation of strong dyeable films and fibers.

3,657,393

PROCESS FOR PREPARATION OF CROSS-LINKED EPICHLOROHYDRIN POLYMER

Keiji Komuro, Yokohama-shi, Masaki Inagami, Toyonaka-shi, and Hideo Fukuda, Chigasaki-shi, Japan, assignors to The Japanese Geon Company, Ltd., Tokyo, Japan

Filed Jan. 21, 1970, Ser. No. 4,597

Claims priority, application Japan, Jan. 25, 1969, 44/5,031

Int. Cl. C08f *29/12*

U.S. Cl. 260—887 3 Claims

A process for the preparation of an epichlorohydrin polymer having improved properties, which comprises treating a blend consisting of 100 parts of an epichlorohydrin polymer having a Mooney viscosity ML_{1+4} (100° C.) of 30 to 140 and 1–30 parts by weight of a diene/acrylonitrile copolymer selected from a butadiene/acrylonitrile copolymer and an isoprene/acrylonitrile copolymer which has a bonded nitrile content of 10 to 60% by weight

and a Mooney viscosity ML_{1+4} (100° C.) of 30 to 130, with a cross-linking agent which crosslinks the epichlorohydrin polymer but not the diene-acrylonitrile copolymer.

3,657,394

BLENDS OF POLYVINYL CHLORIDE RESINS AND ETHYLENE-SO_2 TERPOLYMERS AND FILMS FORMED THEREFROM

Clarence Frederick Hammer and James Joseph Hickman, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Apr. 28, 1970, Ser. No. 32,728

Int. Cl. C08f *29/24*

U.S. Cl. 260—897 C **10 Claims**

Highly compatible, clear blends of PVC resins with ethylene-SO_2 terpolymers can be formed containing 5 to 40 percent of the latter. High modulus films can be extruded therefrom at a reasonable rate.

3,657,395

PROCESS FOR THE PRODUCTION OF HIGH IMPACT STRENGTH EPDM GRAFT COPOLYMERS

Curtis L. Meredith and George A. von Bodungen, Baton Rouge, La., assignors to Copolymer Rubber & Chemical Corporation, Baton Rouge, La.

No Drawing. Filed Jan. 14, 1970, Ser. No. 2,967

Int. Cl. C08f *25/00*

U.S. Cl. 260—878 R **16 Claims**

A new and improved EPDM rubber-modified plastic composition and method for its preparation wherein an alkenyl aromatic monomer, an acrylic monomer and an EPDM terpolymer are reacted in an organic solvent in the presence of a free radical catalyst, and wherein up to 40% by weight of the total amount of one of the monomers is withheld from the reaction mixture and is added in at least one increment to form a final reaction mixture when the monomer not withheld is at least 10% converted.

3,657,396

POLYVINYLMETHYL ETHER ACRYLIC POLYMER CONTAINING PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS

Kaoru Kuramoto and Nobuo Maejima, Tokyo, Kiichiro Miyakubo, Kawagoe-shi, and Isao Uzuki, Sayama-shi, Japan, assignors to Kuramoto Sangyo Co., Tokyo, Japan

No Drawing. Filed Aug. 28, 1968, Ser. No. 755,827

Claims priority, application Japan, Feb. 7, 1968, 43/7,197

Int. Cl. C09j *3/14*

U.S. Cl. 260—901 **3 Claims**

An adhesive composition containing a polyvinylmethyl ether as the principal component and also containing an additive consisting of a water-soluble polymer having compatibility relative to said first mentioned polymer. The composition is not inferior in adhesion, cohesion and tackiness to the conventional pressure-sensitive adhesive composites, and it has the excellent feature that it can be obtained as a transparent, water-soluble product.

3,657,397

TRIALKYL PHOSPHITE-LONG CHAIN ALKENYL HYDROCARBON-SUBSTITUTED SUCCINIC ANHYDRIDE REACTION PRODUCTS

William T. Brannen, West Lake, Ohio, assignor to Standard Oil Company, Chicago, Ill.

No Drawing. Filed May 8, 1969, Ser. No. 823,176

Int. Cl. C07f *9/02*; C10l *1/26*; C10m *1/46*

U.S. Cl. 260—921 **7 Claims**

Trialkyl phosphites, e.g. tributyl phosphite, are reacted with alkenyl hydrocarbon-substituted succinic anhydrides, in which the alkenyl hydrocarbon contains at least 30 carbon atoms, to obtain reaction products which are useful as additives in hydrocarbon fuels and in lubricating oils.

3,657,398

PROCESS FOR THE PRODUCTION OF HALOGENATED ESTERS OF THE PHOSPHORIC ACID

Roshdy Ismail, Spich, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

No Drawing. Filed Mar. 13, 1969, Ser. No. 811,277

Claims priority, application Germany, Mar. 16, 1968, P 16 68 889.4

Int. Cl. C07f *9/12, 9/14*

U.S. Cl. 260—973 **14 Claims**

Improvements in the reaction of halogenated phenols with phosphorus acid chlorides using as the catalyst compounds of elements of Group V–A of the Periodic System, preferably compounds of nitrogen, phosphorus, arsenic or antimony.

3,657,399

METHOD OF CONSTRUCTING A COMPOSITE REFRACTORY HEARTH IN A FLOAT GLASS FURNACE

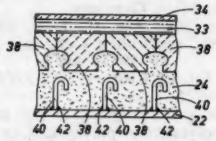
Edgard Brichard, Jumet, Belgium, assignor to Glaverbel, Watermael-Boitsfort, Belgium

Filed Oct. 29, 1969, Ser. No. 873,141

Claims priority, application Luxembourg, Oct. 30, 1968, 57,193

Int. Cl. F27d *1/04, 1/10*

U.S. Cl. 264—30 **3 Claims**



A composite hearth is constructed by casting a first layer of refractory concrete next to the shell and while the castable is still in a plastic condition carbon bricks or blocks having grooves or undercut cavities on one face are pushed into the castable to cause the castable to enter the cavities and upon setting lock the bricks to the castable layer. Carbon powder with or without a binder can be placed in the joints between the carbon blocks. Metal anchors can also be used to hold the castable layer tightly against the shell.

3,657,400

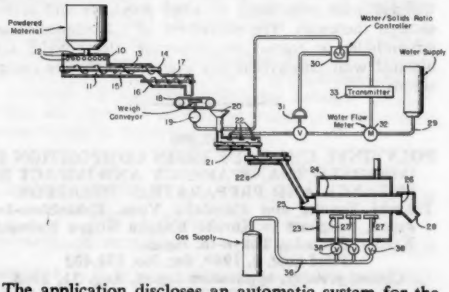
PELLETIZER PROCESS WITH CONTROL SYSTEM

David C. Williams, Houston, Tex., assignor to Ashland Oil, Inc., Houston, Tex.

Original application Apr. 8, 1961, Ser. No. 103,925, now Patent No. 3,337,907, dated Aug. 29, 1967. Divided and this application July 24, 1967, Ser. No. 655,528

Int. Cl. B01j *2/10*

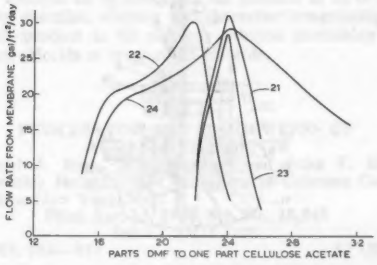
U.S. Cl. 264—40 **4 Claims**



The application discloses an automatic system for the control of pelletizing apparatus in which continuous weighing means (e.g. a weigh belt) are used to generate a signal representative of the weight of a flow of a "loose" powdery solid from a feeder (e.g. feed screw)

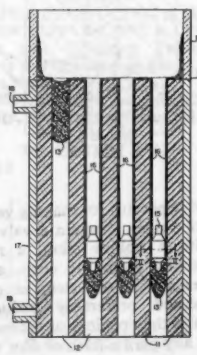
to a pelletizer in which the solid is mixed with a pelletizing fluid, and the flow of pelletizing fluid into the pelletizer is controlled in accordance with the signal by flow regulating means interconnected with the weighing means.

3,657,401
REVERSE OSMOSIS MEMBRANES
Victor James Shayler, Woodstock, and Gordon Arthur Leslie Wells, Witney, England, assignors to Pressed Steel Fisher Limited, Cowley, Oxford, England
Filed June 15, 1970, Ser. No. 46,206
Claims priority, application Great Britain, June 16, 1969, 30,344/69
Int. Cl. B29d *27/00;* **B29k** *7/20*
U.S. Cl. 264—41 **3 Claims**



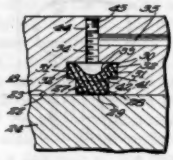
A reverse osmosis membrane is prepared by casting a solution of cellulose acetate, dimethylformamide and acetone wherein the dimethylformamide is present in the proportion of from 50–70 parts by weight to 25 parts by weight of cellulose acetate, and the cast membrane is then washed in cold water and annealed in hot water as in known methods. The use of dimethylformamide in the above proportions allows membranes to be prepared which give improved flux rates as compared with membranes cast from known ternary casting solutions that comprise cellulose acetate, acetone and known swelling or flux inducing additives.

3,657,402
CASTING TUBULAR REVERSE OSMOSIS MEMBRANES IN PLACE
Regis R. Stana, Murrysville, and Andrew S. Calderwood, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 15, 1970, Ser. No. 28,603
Int. Cl. B29d *23/08, 27/04;* **C08b** *29/10*
U.S. Cl. 264—45 **14 Claims**



An open pore module, of bonded resin coated filler particles, having a plurality of spaced bores therethrough containing reverse osmosis membranes, is made by (1) placing the module in a stationary vertical position, (2) placing a viscous casting solution containing polymeric film forming material, a solvent and a leachable swelling agent into each of the bores, (3) gravity dropping a casting bob, having a circular cross-section at its widest point with an outside diameter between 0.02 and 0.12 inch less than the inside diameter of the module bores, at a speed less than 1 inch/sec. down through each bore to form a continuous film of casting solution on the inside of each bore, (4) exposing the film to air and then (5) contacting the film with a leaching liquid to form a reverse osmosis membrane on the inside of each module bore.

3,657,403
METHOD OF MAKING PRESSURIZABLE ELASTOMERIC STRUCTURES
Richard L. Olson, Hickory Hills, Ill., assignor to Dike-O-Seal, Incorporated, Chicago, Ill.
Original application Jan. 18, 1965, Ser. No. 426,308, now Patent No. 3,331,610, dated July 18, 1967. Divided and this application May 3, 1967, Ser. No. 635,911
Int. Cl. B29d *27/00*
U.S. Cl. 264—51 **4 Claims**



An elastomeric body is molded and cured in situ to substantially fill a recess, bonded to side walls defining a recess and maintained in freely separable engagement with a root surface in the recess, so that a pressurizing fluid can be introduced between the body and the root surface.

3,657,404
METHOD AND APPARATUS FOR CLEAVING ANISOTROPIC PYROLYTICALLY DEPOSITED MATERIALS ON CURVED SURFACES
Bruce L. Ettinger, Detroit, Mich., assignor to General Electric Company
Continuation of application Ser. No. 583,814, Oct. 3, 1966. This application May 28, 1969, Ser. No. 833,846
Int. Cl. C04b *35/52, 35/54, 35/58*
U.S. Cl. 264—81 **13 Claims**

A method of separation of articles deposited by gas pyrolysis from termination portions formed during manufacture. The separation of the center portion of the deposited article from the termination portions normally formed during the deposition procedure is facilitated by

forming a radially inwardly extending rounded annular shoulder adjacent to and on the termination side of an annular flange used to create a fault in the deposited article. The combination of the rounded shoulder and the flange produces a fault in the pyrolytically deposited material and stresses on either side of the fault that are opposite in direction which results in a clean separation of the termination portion from the center portion of the deposited pyrolytic article.

3,657,405

PROCESS FOR THE APPLICATION OF A LABEL ON A HOLLOW BODY MADE OF THERMOPLASTIC MATERIAL

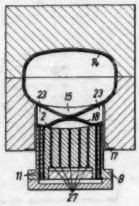
Erhard Langecker, Hohbuschener Weg. 5, Meinerzhagen, Westphalia, Germany

Continuation-in-part of application Ser. No. 767,719, Oct. 15, 1968. This application May 28, 1970, Ser. No. 41,194

Claims priority, application Germany, Aug. 22, 1968, P 17 86 133.5; June 5, 1969, P 19 28 596.2

Int. Cl. B29c *17/07;* **B29d** *23/03;* **B32b** *31/12*

U.S. Cl. 264—89 **4 Claims**



Process for the application of a label on a hollow body of thermoplastic material wherein the label is placed on a movable curved-end member of a blow-mold device while said member is maintained in a retracted position with respect to the cavity of the blow-mold device. A blow blank is inserted into the blow-mold cavity, after which the central portion of the label is caused to be moved out in the direction of the blow blank so that after the blow blank is blown up, said member with the label is moved inwardly against the inflated blow blank and the air between the blank and the label is passed to the exterior of the mold.

In a blow-moulding process, a label is applied to the blow-moulded article while it is still in the mould by placing the label on the front end of a plunger which is initially retracted in a recess in the mould wall. When the article has been blown up, the plunger is advanced to apply the label to the article. Initial contact between the label and the article is over a small area which progressively increases as air is excluded from between the article and the label.

3,657,406

METHOD AND APPARATUS FOR REMOVING BURRS FORMED ON THE NECK OF HOLLOW BODIES

Bernard Delebarre, Dijon, France, assignor to Solvay & Cie, Brussels, Belgium

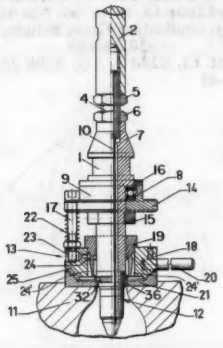
Filed Oct. 17, 1969, Ser. No. 867,256

Claims priority, application Belgium, Oct. 18, 1968, 64,885

Int. Cl. B29c *17/07, 17/12*

U.S. Cl. 264—98 **9 Claims**

The burr formed on the neck of a hollow body made of plastic material in a blow mold having an opening for the insertion of a plastic parison is automatically removed. A blow nozzle having a hollow cutting mandrel at the blowing tip thereof is inserted into the plastic parison. The burr is sheared from the hollow body by bringing the hollow cutting mandrel and the mold opening against one another with an axial displacement of the nozzle in two successive steps, with the parison open and lying between the mandrel and the mold opening. Thereafter, the blow nozzle is rotated about its longitudinal axis to completely sever the burr from the hollow body. A jack having a stationary heel controls the alternating displacement of the blow nozzle, with the nozzle body extending through the jack. A first spiral clutch jaw is mounted on the stationary heel for rotation only. The teeth of this jaw have the shape of a right angle trapezium with a flat crest. A second spiral clutch jaw, identical to the first jaw, is fixedly mounted at the end of the nozzle body for alternately meshing and releasing with respect to the first jaw as the nozzle body is reciprocated by the control jack. A guide cooperating with the second jaw forces the latter in crest abutment with the first jaw during the first step.



3,657,407

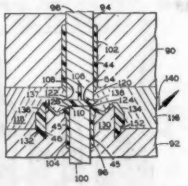
METHOD AND APPARATUS FOR MAKING VALVE UNITS

Erich W. Gronemeyer, 2100 S. Ocean Lane 33316, and Louis F. Kutik, 8720 SW. 23rd Place 33305, both of Fort Lauderdale, Fla.

Filed Feb. 10, 1970, Ser. No. 10,224

Int. Cl. B29c *17/12*

U.S. Cl. 264—156 **6 Claims**



Method of and apparatus for making valve units, particularly for aerosol valves, wherein a valve unit is molded from plastic with a hollow stem, a radial flange or diaphragm projecting from the stem, and openings or recesses for openings in the stem at one side of the flange. The method preferably includes a step of piercing the stem at the openings or recesses for inspection and to penetrate any plastic flash or film which may cover or partially cover the openings. The apparatus includes mold parts particularly adapted to mold the stem, flange and openings on a reliable, high yield basis.

3,657,408
PROCESS FOR SHAPING ACRYLONITRILE POLYMERS

Suresh N. Chinai, Greenwich, Conn., and Edmund Brigmanis, Pensacola, Fla., assignors to American Cyanamid Company, Stamford, Conn.

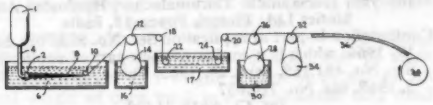
No Drawing. Filed Apr. 24, 1970, Ser. No. 31,753
Int. Cl. D01f *7/00*
U.S. Cl. 264—182 **8 Claims**

Shaped substantially non-porous polymers containing at least about 70 percent by weight acrylonitrile and having a novel crenulated surface having improved resistance to soiling are provided. Such products are prepared by dissolving the polymer in aqueous sodium thiocyanate, extruding or otherwise shaping the solution and thereafter coagulating the shaped product with an aqueous solution containing aluminum chloride, magnesium chloride or calcium chloride or by dissolving the polymer in an organic solvent therefor, shaping and thereafter coagulating the shaped product in an aqueous solution containing aluminum chloride or magnesium chloride.

3,657,409
PROCESS FOR THE PRODUCTION OF ACRYLIC FILAMENTS

Michael J. Ram, West Orange, and John P. Riggs, Berkeley Heights, N.J., asssignors to Celanese Corporation, New York, N.Y.

Filed Apr. 14, 1970, Ser. No. 28,545
Int. Cl. D01f *7/00*
U.S. Cl. 264—182 **11 Claims**

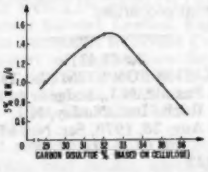


A process is provided for the production of substantially round acrylic filaments which are particularly suited as precursors for the formation of carbon filaments. A fiber-forming acrylic polymer, such as an acrylonitrile homopolymer, while dissolved in a dimethylacetamide containing lithium chloride solvent is extruded into an essentially non-aqueous coagulation bath consisting essentially of ethylene glycol and dimethylacetamide present in concentrations found capable of producing essentially round homogeneous (i.e. substantially free of voids and incursions) filaments. The resulting as-spun filaments are initially washed in relatively cool water, and are drawn to increase their orientation.

3,657,410
PROCESS FOR PRODUCING A HIGH WET MODULUS VISCOSE RAYON

Tadao Sasakura and Mikiharu Yajima, Fukushima, Japan, assignors to Nitto Boseki Co., Ltd., Fukushimashi, Fukushima, Japan

Filed May 23, 1969, Ser. No. 827,281
Claims priority, application Japan, May 23, 1968, 43/34,344
Int. Cl. D01f *3/12*
U.S. Cl. 264—194 **13 Claims**



Producing high wet modulus viscose rayon by spinning a viscose which is xanthated by 29–35% by weight (cellulose basis) of carbon disulfide. The spinning solution contains one or more fatty or cyclic monoamines having 1–6 carbon atoms, or alkylene oxide derivatives of such amines, in combination with one or more zinc compounds which are soluble in sodium hydroxide or water in an amount greater than 0.05% by weight. Each of the above groups of materials must be added in an amount greater than 0.1% by weight (cellulose basis). Spinning occurs into a sulfuric acid-sulfate type spinning solution containing more than 1% by weight zinc sulfate.

In a preferred embodiment, polyethylene glycol is also added.

3,657,411
TWO-STAGE DRAWING PROCESS FOR POLYBENZIMIDAZOLE FIBER

Thomas C. Bohrer, Charlotte, N.C., and David H. T. Chen, Wilmington, Del., assignors to Celanese Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 770,083, Oct. 23, 1968. This application Sept. 15, 1970, Ser. No. 72,535
Int. Cl. D02j *1/22*
U.S. Cl. 264—290 R **11 Claims**

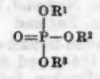
Polybenzimidazole fiber is drawn in two-stages wherein the second draw is at a lower temperature than the first. After double drawing the tenacity and initial modulus of the fiber are higher than after the first stage draw. The first stage draw may be effected at a temperature in the range 300–650° C. with a ratio of 1.5–3.5× while the second stage draw may be conducted at a lower temperature in the range 200–500° C. with a ratio of 1.05–1.5×. Various means of heating are disclosed, including radiation and contact with hot metal surfaces. Exposure time is disclosed to be a function of the mode of heating and the temperature used.

3,657,412
WOOD IMPREGATION COMPOSITIONS WITH PHOSPHORIC ACID ESTER SOLVENT

Wolfgang Reuther, Heidelberg, Harro Petersen, Frankenthal, Paul Raff, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Jan. 26, 1970, Ser. No. 5,946
Claims priority, appplication Germany, Jan. 28, 1969, P 19 04 072.3
Int. Cl. B27k *3/38*
U.S. Cl. 424—15.7 **8 Claims**

An impregnant for wood comprising a salt of N-nitrosocyclohexylhydroxylamine dissolved in a solvent of a phosphoric acid ester of the formula:



wherein the radicals R^1, R^2 and R^3 which may be identical or different, are alkyl, cycloalkyl, alkoxyalkyl or aryl radicals, or R^1 and R^2 together denote an alkylene radical.

3,657,413
ANTISEPTIC COMPOSITION CONTAINING PEROXIDE, GLYCEROL, AND CARBOXYPOLYMETHYLENE POLYMER

Murray W. Rosenthal, East Brunswick, N.J., assignor to Block Drug Company, Inc., Jersey City, N.J.

No Drawing. Filed Aug. 28, 1969, Ser. No. 853,953
Int. Cl. A61k *27/00*
U.S. Cl. 424—81 **5 Claims**

An antiseptic composition containing a peroxide, glycerol, and a carboxypolymethylene polymer. The carboxy-

polymethylene polymer thickens and imparts sustained release properties to the composition, which is useful for antiseptic treatment of oral soft tissues, wounds, and the like.

3,657,414

FORMULATION OF A BOLL WEEVIL FEEDING STIMULANT MIXTURE

Paul A. Hedin and Lavenia R. Miles, Starkville, James P. Minyard, State College, and Alonzo C. Thompson, Starkville, Miss., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Feb. 10, 1969, Ser. No. 798,107

Int. Cl. A01n *17/14*

U.S. Cl. 424—84 **11 Claims**

Several formulations have been prepared from a group of 52 organic chemical stimulants of certain insects. The formulations can include select biological agents, such as insecticides, in unique formulations which serve as "poison bait" to insects such as the boll weevil. These can generally be dispensed by ordinary means, such as sprays or pellets, which would kill the offending insect without damaging the plants thus treated. A ratio of inactive vessel to active ingredient of 200 to 1, respectively, has been found suitable for most applications.

3,657,415

CANINE HOOKWORM VACCINES

Francis W. Jennings, William Mulligan, George M. Urquart, William I. Mackay McIntyre, and William F. H. Jarrett, Glasgow, Scotland, assignors to The University Court of the University of Glasgow, Gilmorehill, Glasgow, Scotland

No Drawing. Continuation-in-part of application Ser. No. 675,252, Oct. 13, 1967, which is a continuation of application Ser. No. 402,925, Oct. 9, 1964. This application Aug. 1, 1969, Ser. No. 846,976

Claims priority, application Great Britain, Oct. 10, 1963, 40,085/63

Int. Cl. C12k *5/00, 9/00*

U.S. Cl. 424—88 **11 Claims**

The invention relates to a veterinary vaccine for parenteral administration to animals of the family Canidae. The vaccine comprises a physiologically acceptable aqueous vehicle containing attenuated premigratory live hookworm larvae.

3,657,416

THROMBIN-LIKE DEFIBRINATING ENZYME FROM THE VENOM *ANCISTRODON RHODOSTOMA*

Hugh Alistair Reid, Liverpool, and Michael Peter Esnouf, Oxford, England, and Kok Ewe Chan, Kuala Lumpur, Malaya, assignors to National Research Development Corporation, London, England

No Drawing. Continuation-in-part of applications Ser. No. 350,644, Mar. 10, 1964, and Ser. No. 433,215, Feb. 16, 1965. This application July 25, 1967, Ser. No. 655,781

Claims priority, application Great Britain, Feb. 21, 1964, 7,264/64

Int. Cl. A61k *17/08, 19/00;* **C07g** *7/026*

U.S. Cl. 424—94 **5 Claims**

Ancistrodon rhodostoma venom may be purified by removal of proteolytic enzymes which cause tissue and vascular necrosis to produce a purified fraction having thrombin-like defibrinating activity associated with an enzyme which may be isolated in highly pure form. The preparation of pharmaceutically acceptable venom fractions by chromatography on weakly basic anion exchange materials and their use in the treatment of mammalian blood is described. The purified enzyme is characterised by physical, chemical, and biological properties.

3,657,417

THYMUS EXTRACT HAVING A THERAPEUTIC ACTION

Brunetto Brunetti and Emilio Pini, Milan, Italy, assignors to Laboratori farmaco-biologici ELLEM S.p.A., Milan, Italy

No Drawing. Filed May 26, 1969, Ser. No. 827,928

Int. Cl. A61k *17/00*

U.S. Cl. 424—95 **1 Claim**

Calf thymus extract having an anti-leukopenic action obtained by partially lysing and deproteinizing fragments of the thymus of a recently slaughtered calf, filtered and diluted in a physiological salt solution.

3,657,418

ANTIBIOTIC HISTIDOMYCIN

Thomas C. Demny, Roselle Park, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation of application Ser. No. 589,258, Oct. 25, 1966. This application Aug. 27, 1968, Ser. No. 767,021

Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **3 Claims**

Histidomycin, an antibiotic containing two active components, histidomycin A and histidomycin B, is produced by growing *Nocardia histidans*. The new antibiotics are antimicrobial agents active against gram-positive and gram-negative bacteria.

3,657,419

ANTIAMOEBIN, AN ANTHELMINTIC AND ANTIPROTOZOAL ANTIBIOTIC, AND A METHOD FOR PRODUCING THE SAME

Mandayam Jeersannidhi Thirumalachar, Hindustan Antibiotics Ltd., Pimpri, Poona 18, India

Continuation-in-part of application Ser. No. 573,705, Aug. 19, 1966, which is a continuation-in-part of application Ser. No. 491,159, Sept. 29, 1965. This application Mar. 5, 1968, Ser. No. 710,637

Int. Cl. A61k *21/00*

U.S. Cl. 424—119 **8 Claims**

An anthelmintic and antiprotozoal antibiotic designated "Antiamoebin" is disclosed which is produced by cultivating at least one micro-organism taken from the group consisting of *Emericellopsis synnematicola* (ATCC 16540), *E. poonensis* (ATCC 16411), and *Cephalosporium pimprina* (ATCC 16541) in a broth culture medium containing carbohydrates, nitrogen and inorganic salts.

3,657,420

ANTIBIOTIC PREPARED BY CULTIVATION OF *STREPTOMYCES ROSEOPULLATUS* AND DESIGNATED 17967 RP

Denise Mancy, Charenton, Val-de-Marne, and Leon Ninet and Jean Preud'homme, Paris, France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 12, 1969, Ser. No. 823,557

Claims priority, application France, May 13, 1968, 151,589

Int. Cl. A61k *21/00*

U.S. Cl. 424—121 **10 Claims**

The antibiotic designated 17,967 R.P. is prepared by aerobically cultivating *Streptomyces roseopullatus* DS 20,073 (NRRL 3430), which is a new species of Streptomyces, using an aqueous nutrient medium containing assimilable sources of carbon, nitrogen and inorganic substances. The antibiotic has an antimitotic activity in addition to antibacterial properties.

3,657,421

ANTIBIOTIC X–5108 FOR STIMULATING GROWTH

Julius Berger, Passaic, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 28, 1970, Ser. No. 67,724

Int. Cl. A61k *21/00*

U.S. Cl. 424—122 **5 Claims**

A new antibiotic, designated as antibiotic X–5108, is produced by a new species of Styreptomyces. The new

antibiotic is active against gram-positive and gram- negative bacteria and produces growth stimulation and increased feed efficiency in poultry.

3,657,422
ANTIBIOTIC AABOMYCIN-A AND PROCESS FOR PREPARING THE SAME

Tomomasa Misato, Tokyo, Keng Tang Huang, Saitama-Ken, Shiroh Shirato, Tokyo, Akio Seino, Kanagawa-ken, Yuko Nakamura, Tokyo, and Shojiro Aizawa and Ryusuke Taguchi, Saitama-ken, Japan, assignors to Kaken Kagaku Kabushiki Kaisha, Tokyo, and Rikagaku Kenkyusho, Kitaadachi-gun, Saitama-ken, Japan

Filed Dec. 5, 1969, Ser. No. 882,504
Claims priority, application Japan, Dec. 9, 1968, 43/89,533
Int. Cl. A61k *21/00*
U.S. Cl. 424—122 3 Claims

A new antibiotic Aabomycin-A having a strong antifungal and antiviral potency is recovered from a culture of Aabomycin-A producing microorganism designated Streptomyces sp. 325–17 (ATCC 21449) as a pure crystal.

3,657,423
CHICKEN FEED COMPOSITION CONTAINING FLY ASH FOR WEIGHT GAIN

Harold Yacowitz, Piscataway, N.J., assignor to The Amburgo Company, Incorporated, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 706,686, Feb. 19, 1968. This application Nov. 18, 1970, Ser. No. 90,779
Int. Cl. A61k *27/00*
U.S. Cl. 424—127 5 Claims

An improved chicken feed composition may be made by substituting ½ to 5 weight percent of fly ash for an equal weight of corn meal in a conventional corn meal type feed. The improved feed may be relatively easily pelleted and requires a lower ratio of pounds of feed to achieve a given degree of animal weight gain. The feed may also contain a small amount of binder for the fly ash to reduce dust.

3,657,424
FULL-FLAVORED CITRUS JUICE ENERGY SUPPLEMENT

Cedric Donald Aktins and John Allen Attaway, Winter Haven, Fla., assignors to State of Florida, Department of Citrus

No Drawing. Continuation-in-part of application Ser. No. 815,506, Apr. 11, 1969. This application Apr. 1, 1970, Ser. No. 24,820
Int. Cl. A61k *27/00*
U.S. Cl. 424—153 10 Claims

A fortified citrus juice or other acid fruit juice is provided having increased amounts of sodium, calcium and chloride ions, beyond what is naturally present in the juice, in order to supplement the requirements of individuals having diminished amounts of these substance present in their body fluids.

3,657,425
BEEF INSULIN PREPARATIONS

George Alexander Stewart, London, England, assignor to Burroughs Wellcome Co.

Continuation-in-part of applications Ser. No. 458,769, May 25, 1965, and Ser. No. 668,415, Sept. 18, 1967. This application Mar. 12, 1969, Ser. No. 806,681
Int. Cl. A61k *17/02*
U.S. Cl. 424—178 3 Claims

A stable and pharmaceutically acceptable solution of insulin, comprising beef insulin which has a molecular weight of 5734, substantially the following elementary analysis: carbon 53.21%, hydrogen 6.63%, nitrogen 15.88%, sulphur 3.36%, and oxygen 20.92% (by difference), and characteristically alanine, serine, and valine in the 8th, 9th and 10th position of the A chain and alanine in the 30th position of the B chain, and has

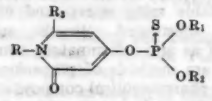
(1) a protaminase content causing less than about 15% w./w. loss at 37° C. in 30 days when the insulin is converted into a protamine-containing isophane insulin suspension,
(2) an optical density (absorbence), corrected to a manifold diluted sample, of less than about 0.5 as a 1% acid solution in a 4 cm. cell at a wavelength of 396 mμ,
(3) an optical density (absorbence) of less than about 0.03 at a wavelength of 400 mμ when measured as a 40 international units/ml. solution in a 1 cm. cell at a pH of 7.4, after standing at 5° C. for eight days, with an instrument adapted to exclude scattered light, and,
(4) an infra-red spectrum such as shown in the drawing; as an aqueous solution, adjusted to a pH between pH 7 and 8.

3,657,426
NOVEL METHOD OF CONTROLLING NEMATODES

Paul Herman Schroeder, Medina, N.Y., assignor to FMC Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 605,993, Dec. 30, 1966. This application Nov. 26, 1969, Ser. No. 880,381
Int. Cl. A01n *9/22*
U.S. Cl. 424—200 12 Claims

Nematodes and other parasitic worm life in the soil are controlled by application of pyridonyl phosphorothionates of the general formula



wherein R and R_3 are low molecular weight hydrocarbon radicals, and R_1 and R_2 are low molecular weight alkyl radicals. The preparation and physical properties of representative compounds of this class, and their application for the control of nematodes, are illustrated.

3,657,427
NEMATOCIDAL USAGE OF O-ETHYL S-(2-CHLOROALLYLTHIOMETHYL) METHYLPHOSPHONODITHIOATE

John P. Chupp, Kirkwood, and Robert J. Balske, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,085
Int. Cl. A01n *9/36*
U.S. Cl. 424—216 3 Claims

The life cycle of nematode parasites is terminated by applying a nematocidally effective amount of O-ethyl S-(2 - chloroallylthiomethyl)methylphosphonodithioate to nematode infested soil.

3,657,428
SULFAGUANIDINE USED AGAINST MAREK'S DISEASE

Tsung-Ying Shen, Westfield, and Theodore A. Maag, New Shrewsbury, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 30, 1970, Ser. No. 51,340
Claims priority, application Great Britain, July 17, 1969, 36,089/69
Int. Cl. A61k *27/00*
U.S. Cl. 424—228 6 Claims

The use of sulfaguanidine and soluble salts thereof in reducing mortality and decreasing lesion incidence of

poultry exposed to Marek's disease and to compositions comprising the sulfaguanidine as the active ingredient are provided.

3,657,429

N'-SUBSTITUTED N-ARYLSULFONYL UREA FOR PRODUCING A HYPOGLYCAEMIC EFFECT

Henri Dietrich, Arlesheim, Basel-Land, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Original application July 6, 1967, Ser. No. 651,363, now Patent No. 3,535,313, dated Oct. 20, 1970. Divided and this application Feb. 2, 1970, Ser. No. 12,498

Claims priority, application Switzerland, July 12, 1966, 10,126/66

Int. Cl. A61k *27/00*

U.S. Cl. 424—229 2 Claims

N-(p-aminophenylsulfonyl)-2-aza-bicyclo[2,2,2]octane-2-carboxamide which has a useful hypoglycaemic action and an intermediate for its production; therapeutical compositions containing this amide and processes of producing a hypoglycaemic effect in a mammal.

3,657,430

COMPOSITION AND METHODS FOR TREATING INFLAMMATION

Tsung-Ying Shen, Gordon L. Walford, and Bruce E. Witzel, Westfield, and Robert L. Bugianesi, Colonia, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 25, 1969, Ser. No. 836,604

Int. Cl. A61k *27/00*

U.S. Cl. 424—230 8 Claims

New substituted salicylic acids and nontoxic pharmaceutically acceptable salts, esters, and amides derived therefrom. The substituted salicyclic acids described herein are useful as anti-inflammatory compounds. Also included herein are methods of preparing said salicylic acid compounds, pharmaceutical compositions having said salicylic acid compounds as an active ingredient and methods of treating inflammation by administering these particular compositions to patients.

3,657,431

TREATING OF INFLAMMATION WITH SUBSTITUTED PHENYLTHIOSALICYLIC ACIDS

Tsung-Ying Shen, Gordon L. Walford, and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed June 25, 1969, Ser. No. 836,611

Int. Cl. A61k *27/00*

U.S. Cl. 424—230 5 Claims

New substituted phenylthiosalicyclic acids and nontoxic pharmaceutically acceptable salts, esters, anhydrides, and amides derived therefrom. The substituted phenylthiosalicylic acids described herein have anti-inflammatory, anti-pyretic, and analgesic activity. Also included are methods for preparing said phenylthiosalicylic acid compounds.

3,657,432

ANTI-INFLAMMATORY SALICYLIC ACID DERIVATIVES

Tsung-Ying Shen, Gordon L. Walford, and Bruce E. Witzel, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 836,622, June 25, 1969. This application Apr. 20, 1970, Ser. No. 30,323

Int. Cl. A61n *27/00*

U.S. Cl. 424—232 4 Claims

Salicylic acid derivatives and their non-toxic pharmaceutically acceptable salts, esters and amides are claimed. Also encompassed is the treatment of inflammation with said derivatives.

3,657,433

GASTROPODICIDAL COMPOSITIONS

Walter A. Darlington, Brentwood, and George F. Ludvik, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Sept. 18, 1969, Ser. No. 859,179

Int. Cl. A01n *9/20, 9/30*

U.S. Cl. 424—235 3 Claims

Mixtures of sodium pentachlorophenate and a 3-substituted-2',5-dichloro-4'-nitrosalicylanilide for the destruction of adult gastropods and their eggs.

3,657,434

21-(TETRAHALOCYCLOBUTYL CARBOXYLIC ACID) STEROID ESTERS

Kurt Radscheit, Kelkheim, Taunus, Werner Fritsch, Neuenhain, Taunus, and Werner Haede, Ulrich Stache, and Hans-Georg Schröder, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Sept. 17, 1969, Ser. No. 858,888

Claims priority, application Germany, Sept. 20, 1968, P 17 93 461.1

Int. Cl. C07c *169/36, 175/00*

U.S. Cl. 424—241 7 Claims

21 - (cyclobutyl - carboxylic acid) - esters of 3 - oxo-Δ^4 - steroids useful as anti-inflammatory agents, and their manufacture by reaction of cyclobutane carboxylic acid chloride with corresponding 21-hydroxy-steroids.

3,657,435

17β-HYDROXY - 17 - ETHYNYL-4-ANDROSTENO-[3,2-c] - 2'-(p-FLUOROPHENYL)PYRAZOLE AND COMPOSITIONS CONTAINING SAME

Frederik W. Stonner, Chatham, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 659,292, Aug. 9, 1967. This application Dec. 4, 1969, Ser. No. 882,307

Int. Cl. C07c *173/00*

U.S. Cl. 424—241 3 Claims

17β-hydroxy - 17 - ethynyl-4-androsteno[3,2-c]-2'-(p-fluorophenyl)pyrazole, prepared from 2-hydroxymethylene-17β-hydroxy - 17 - ethynyl - 4 - androsten-3-one and p-fluorophenylhydrazine, is a useful anti-inflammatory agent, especially for topical application in an ointment or cream base.

3,657,436

METHOD OF TREATING COL-SK VIRUS INFECTIONS

Leo Berger, Montclair, Emanuel Grunberg, North Caldwell, Arthur Stempel, Teaneck, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

No Drawing. Continuation-in-part of application Ser. No. 755,771, Aug. 28, 1968, which is a continuation-in-part of application Ser. No. 559,771, June 21, 1966. This application Feb. 9, 1970, Ser. No. 10,037

Int. Cl. A61k *27/00*

U.S. Cl. 424—244 8 Claims

Anthranilic acid derivatives which are useful in combatting viral infections caused by Col-SK and compositions containing these derivatives.

3,657,437

AGENTS INHIBITING FUNGUS GROWTH AND METHOD OF CONTROLLING FUNGI THEREWITH

Jorg Bader, Arlesheim, and Karl Gatzi, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Division of application Ser. No. 706,614, Feb. 19, 1968, now Patent No. 3,527,867, which is a continuation-in-part of application Ser. No. 621,800, Mar. 9, 1967, which in turn is a continuation-in-part of application Ser. No. 555,994, June 8, 1966. This application Apr. 13, 1970, Ser. No. 34,919

Claims priority, application Switzerland, June 11, 1965, 8,200/65; Feb. 23, 1967, 2,700/67

Int. Cl. A01n *9/12, 9/22;* C07d *71/00*

U.S. Cl. 424—248 4 Claims

Agents for inhibiting the growth of fungi, which contain as active component 5-amino-1,2-dithiol-3-ones substituted at the amino group and also in 4-position, and method of controlling phytopathogenic and other noxious fungi with such agents, which are of surprisingly low phytotoxicity.

3,657,438

COMPOSITIONS AND METHODS FOR TREATING INFLAMMATION

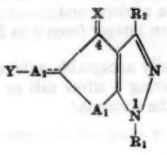
Herbert Morton Blatter, Springfield, and Robert Armistead Lucas, Mendham, N.J., assignors to Ciba Corporation, Summit, N.J.

No Drawing. Filed Sept. 27, 1968, Ser. No. 763,410

Int. Cl. A61k *27/00*

U.S. Cl. 424—248 5 Claims

5-aminoaliphatyl - cycloalkano[c]pyrazoles, e.g. those of the formula



$R_{1,2}$=H, alkyl, aralkyl or aryl
A_1=alkylene
A_2=alkylidene or alkylidyne
X=H_2,HOH or O
Y=an amino group

2-R_1-isomers, acyl derivatives, quaternaries and salts thereof exhibit antiinflammatory and antiarrhythmic effects.

3,657,439

5 - ARYLOXYATRICYCLO[3.2.2.0^{2,4}]NONANE - 1-AMINES IN ANTIDEPRESSANT COMPOSITIONS AND METHODS

Paul E. Aldrich, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Original application Aug. 19, 1968, Ser. No. 753,727, now Patent No. 3,428,643. Divided and this application Aug. 19, 1970, Ser. No. 65,290

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 8 Claims

5-phenyl, 5-substituted phenyl, 5-pyridyl, and 5-substituted pyridyl oxatricyclo[3.2.2.0^{2,4}]nonan-1-amines, and N-carboalkoxy-5-phenyl, 5-substituted phenyl, 5-pyridyl, and 5-substituted pyridyl oxatricyclo[3.2.2.0^{2,4}]nonan-1-amines as antidepressants.

3,657,440

AMINOALKYL-SPIROCYCLOALKANES AS ANALGETIC AGENTS

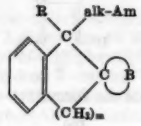
Lincoln Harvey Werner, Summit, N.J., assignor to Ciba-Geigy Corporation, Summit, N.J.

No Drawing. Filed Apr. 23, 1968, Ser. No. 723,585

Int. Cl. A61k *27/00*

U.S. Cl. 424—267 2 Claims

1-aminoalkyl-benzcycloalkane - 2 - spirocycloaliphatic compounds, e.g. those of the formula



alk=lower alkylene
Am=an amino group
R=H or OH
B=lower alkylene or alkylene
m=1–3

acyl and 1-dehydro derivatives, salts and quaternaries thereof exhibit analgetic effects.

3,657,441

METHOD OF INHIBITING THE FORMATION OF PHENYLETHANOLAMINE N-METHYL TRANSFERASE WITH IMIDAZOLES

Norman P. Jensen, Watchung, and Tsung-Ying Shen and Thomas B. Windholz, Westfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 8,011, Feb. 2, 1970. This application July 30, 1970, Ser. No. 59,763

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 1 Claim

New 4-phenylimidazoles and 2,4-bis-phenylimidazoles useful in the inhibition of phenylethanolamine-N-methyl transferase.

3,657,442

N-TRITYL-IMIDAZOLES FOR TREATING FUNGAL INFECTIONS

Karl H. Buchel, Leverkusen, and Erik Regel and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

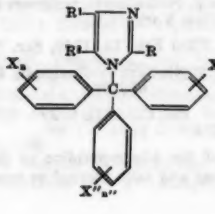
No Drawing. Original application Sept. 9, 1968, Ser. No. 758,594. Divided and this application May 11, 1970, Ser. No. 36,394

Claims priority, application Germany, Sept. 15, 1967, F 53,504

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 4 Claims

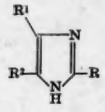
N-trityl-imidazoles and salts thereof of the formula:



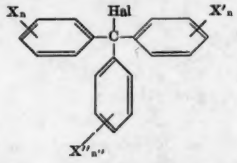
wherein

R, R^1 and R^2 are hydrogen, lower alkyl or phenyl, or R^1 and R^2 together form an annulated benzene ring,
X, X′ and X″ are alkyl of 1 to 12 carbon atoms or an electro-negative moiety, and
n, *n′* and *n″* are an integer from 0 to 2,

or pharmaceutically acceptable acid salts thereof may be produced by reacting a silver salt or alkali metal salt of an imidazole of the formula:



with a trityl halide of the formula:



wherein the substituents are as above defined and Hal is halogen. These compounds are useful as antimycotics.

3,657,443

2-BENZIMIDAZOLECARBAMIC ACID, ALKYL ESTERS AS FOLIAR FUNGICIDES

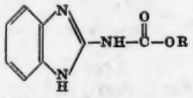
Hein Louis Klopping, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Continuation-in-part of application Ser. No. 727,036, May 6, 1968, which is a continuation-in-part of abandoned application Ser. No. 629,914, Apr. 11, 1967. This application Sept. 29, 1969, Ser. No. 862,081

Int. Cl. A01n *9/22*

U.S. Cl. 424—273 **3 Claims**

Compounds of the formula:



where R is methyl or ethyl, particularly when in the form of particles below 5 microns in diameter, are useful as fungicides to control fungus diseases of living plants. When these compounds are formulated or mixed with suitable adjuvants, such as nonphytotoxic spray oils or humectants, improved fungicidal activity is obtained with continuing safety to the treated plants.

3,657,444

METHODS OF COMBATING NEMATODES IN THE SOIL

Martin Jacob Handele, Johannes Kuipers, and Kobus Wellinga, Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

No Drawing. Filed Feb. 14, 1966, Ser. No. 527,096

Claims priority, application Netherlands, Feb. 18, 1965, 6502006

Int. Cl. A01n *9/22*

U.S. Cl. 424—274 **9 Claims**

Compounds of the 4-halo-pyridine or the 4-halo-pyridine-N-oxide class and salts thereof as nematocides.

3,657,445

N-TRITYL-IMIDAZOLES FOR TREATING FUNGAL INFECTIONS

Karl H. Buchel, Leverkusen, Erik Regel, Wuppertal-Cronenberg, and Manfred Plempel, Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

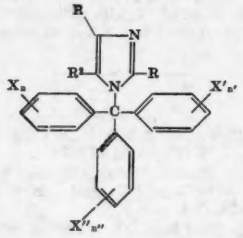
No Drawing. Original application Sept. 9, 1968, Ser. No. 758,594. Divided and this application May 11, 1970, Ser. No. 36,395

Claims priority, application Germany, May 15, 1967, F 53,504

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 **4 Claims**

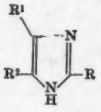
N-trityl-imidazoles and salts thereof of the formula:



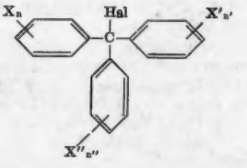
wherein

R, R^1 and R^2 are hydrogen, lower alkyl or phenyl, or R^1 and R^2 together form an anellated benzene ring,
X, X′ and X″ are alkyl of 1 to 12 carbon atoms or an electro-negative moiety, and
n, *n′* and *n″* are an integer from 0 to 2,

or pharmaceutically acceptable acid salts thereof may be produced by reacting a silver salt or alkali metal salt of an imidazole of the formula:



with a trityl halide of the formula:



wherein the substituents are as above defined and Hal is halogen. These compounds are useful as antimycotics.

3,657,446

PROCESS FOR PREPARATION OF A PESTICIDE IN DRY FORM

Kenneth A. E. Blackmore, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

No Drawing. Filed Sept. 15, 1966, Ser. No. 579,487
Int. Cl. A01n 9/12, 9/20
U.S. Cl. 424—274 10 Claims

Preparation of a high-density, readily miscible dry pesticide by spray drying an emulsion obtained by intermixing a lignosulfonate aqueous solution with a solution of the pesticide in a water-immiscible solvent. The spray-dried product is ground and granulated by moistening the ground product with a lignosulfonate solvent in which the pesticide is insoluble and mixing the moistened product to agglomerate the product to form granules.

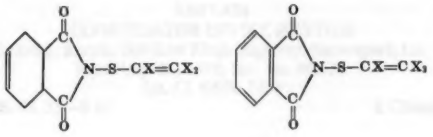
3,657,447

METHOD OF CONTROLLING BACTERIA AND FUNGI

Edward D. Weil, Yonkers, Keith J. Smith, Lockport, and Emil J. Geering, Grand Island, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Application Jan. 29, 1968, Ser. No. 701,049, now Patent No. 3,489,766, dated Jan. 13, 1970, which is a continuation-in-part of application Ser. No. 605,535, Dec. 29, 1966, which in turn is a continuation-in-part of application Ser. No. 852,931, Nov. 16, 1957. Divided and this application Oct. 20, 1969, Ser. No. 871,236
Int. Cl. A01n 9/22
U.S. Cl. 424—274 6 Claims

The method of controlling microbes, comprising applying an effective amount of a compound selected from the group consisting of



wherein X is a halogen, to the locus to be treated.

3,657,448

METHOD OF CONTROLLING UNDESIRABLE FISH

Philip H. Derse, 3547 Topping Road, Madison, Wis. 53705

No Drawing. Filed Sept. 22, 1969, Ser. No. 860,021
Int. Cl. A01n 23/00
U.S. Cl. 424—277 5 Claims

A method for selectively controlling certain undesired fish species which comprises causing said undesired fish species to be contacted with a small but toxic amount of the compound 2,3-dicyano-1,4-dithia-anthraquinone or suitable salts thereof.

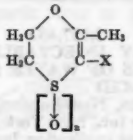
3,657,449

CONTROL OF VIRUS DISEASES OF PLANTS WITH CARBOXAMIDO OXATHIINS

Robert A. Davis, Cheshire, and Robert E. Grahame, Waterbury, Conn., and Marshall Kulka, Guelph, Wellington, Canada, assignors to Uniroyal, Inc., New York, N.Y., and Uniroyal Ltd., Montreal, Quebec, Canada

No Drawing. Filed Mar. 9, 1970, Ser. No. 17,945
Int. Cl. A01n 9/12
U.S. Cl. 424—276 7 Claims

Plant diseases caused by virus, such as tobacco ringspot and southern bean mosaic, are controlled by application of 5,6 - dihydro - 2 - methyl-1,4-oxathiin-3-carboxamides (also called 2,3-dihydro-5-carboxamido-6-methyl-1,4-oxathiins) of the formula



wherein X is a carboxamide (usually N-substituted) group and *n* is zero, 1 or 2. Examples of the chemicals are 5,6-dihydro - 2 - methyl-N-(2-biphenylyl)-1,4-oxathiin-3-carboxamide, 5,6 - dihydro - 2 - methyl-N-(m-tolyl)-1,4-oxathiin-3-carboxamide-4,4-dioxide, and 5,6-dihydro-2-methyl-N-(2,6-dimethylphenyl)-1,4-oxathiin-3-carboxamide.

3,657,450

DERIVATIVES OF DIBENZOCYCLOHEPTENES FOR TREATING CARDIAC ARRHYTHMIAS

Marcia E. Christy, Perkasie, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

No Drawing. Original application Aug. 20, 1968, Ser. No. 753,867, now Patent No. 3,564,015, dated Feb. 16, 1971. Divided and this application Mar. 24, 1970, Ser. No. 24,902
Int. Cl. A61k 27/00
U.S. Cl. 424—283 3 Claims

Novel 10,11 - dihydro - 5,10-epoxy-5H-dibenzo[a,d]cycloheptenes, wherein the moiety substituted at the 5-position is a primary, secondary or tertiary-aminomethyl group, possessing anti-arrhythmic activity are disclosed, as well as intermediates and processes for their preparation and use.

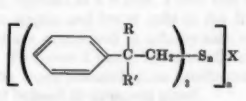
3,657,451

ORGANO-TIN MITICIDES AND METHOD OF USING THE SAME

Charles A. Horne, Jr., Modesto, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 25,302, Apr. 2, 1970. This application Feb. 8, 1971, Ser. No. 113,715
Int. Cl. A01n 9/00
U.S. Cl. 424—288 9 Claims

A method of killing or controlling mites by contacting them with an organo-tin compound of the formula



wherein R is a hydrocarbon group, R′ is H or R, X is an electro-negative group and *n* is 1 or 2.

3,657,452

3,4 - DICARBETHOXY-β-PHENETHYLCARBAMIC ACID, ETHYL ESTER IN TREATING PARKINSONISM

Irwin L. Klundt, Brookfield, and Robert Lenga and Edward J. Warawa, Milwaukee, Wis., assignors to Aldrich Chemical Company, Milwaukee County, Wis.

No Drawing. Filed Dec. 9, 1970, Ser. No. 96,617
Int. Cl. A61k 27/00
U.S. Cl. 424—300 2 Claims

Methods of treating the symptoms of Parkinsonism comprising administering a therapeutically effective

amount of 3,4-dicarbethoxy-β-phenethylcarbamic acid, ethyl ester to patients in need of such treatment.

3,657,453

INTRAVENOUSLY INJECTABLE HEMOSTATIC COMPOSITIONS OF WATER SOLUBLE SALTS OF ELLAGIC ACID

Francis A. Hochstein, New London, Conn., assignor to Pfizer Inc., New York, N.Y.

No Drawing. Original application Jan. 16, 1967, Ser. No. 609,346, now Patent No. 3,576,007. Divided and this application June 1, 1970, Ser. No. 54,054

Int. Cl. A01n *9/28;* **A61k** *27/00;* **C07d** *7/24*

U.S. Cl. 424—279 **5 Claims**

The soluble dicholine and bis-triethylamine salts of ellagic acid are prepared, aqueous solutions of which are useful as intravenously injectable hemostatic agents.

3,657,454

METHODS OF CONTROLLING SHORT-TAILED MICE

Christa Fest, Wuppertal-Elberfeld, and Gunther Hermann, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 29, 1969, Ser. No. 872,345

Claims priority, application Germany, Nov. 16, 1968, P 18 09 383.9

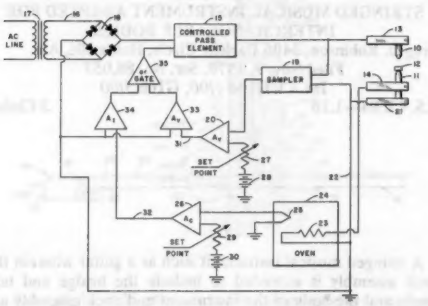
Int. Cl. A01n *9/12*

U.S. Cl. 424—301 **1 Claim**

Methods of selectively combating and controlling short-tailed mice using certain (1-fluoroacetylamino-2,2,2-trichloro-eth-1-yl)-(alkoxythiocarbonyl, benzoyl and alkylphenyl)-thioethers, i.e. 1 - (alkoxythiocarbonylmercapto, benzoylmercapto and alkylphenylmercapto) - 1 - fluoroacetylamino - 2,2,2 - trichloro-ethanes, which are known, which possess selective rodenticidal properties, and which may be produced by conventional methods.

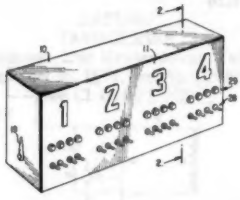
ELECTRICAL

3,657,455
TEMPERATURE REGULATOR
Blount C. Trice, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Filed Apr. 30, 1970, Ser. No. 33,464
Int. Cl. H05b *7/18*
U.S. Cl. 13—12 **1 Claim**



The temperature within an analytical electrode gap is controlled by regulating the gap power supply in response to measurement of changes in the voltage across the gap and changes in the resistivity of the electrode material.

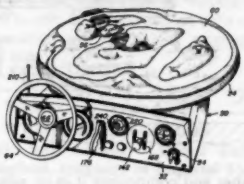
3,657,456
COORDINATOR DEVICE RHYTHM
Edward J. Kozak, 109 East Kings Highway, Shreveport, La.
Filed Aug. 26, 1970, Ser. No. 40,631
Int. Cl. G09b *7/00*
U.S. Cl. 35—8 R **5 Claims**



A device for teaching coordination or rhythm which includes a plurality of figures which may be illuminated in varying cycles of equally spaced intervals, a plurality of illuminatable lamps associated with each of said figures, an equal number for each of said figures, and a multiplicity of switches for said lamps so that any or all of said lamps associated with said figures may be illuminated simultaneously or in a chosen pattern for a cycle of numbers.

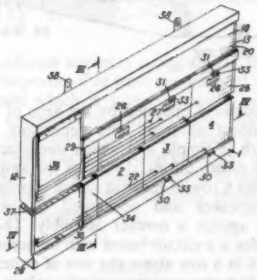
3,657,457
APPARATUS FOR TESTING DRIVING SKILL
Donald B. Poynter, 7 Arcadia Place, Cincinnati, Ohio
Filed July 22, 1970, Ser. No. 57,122
Claims priority, application Japan, Sept. 22, 1969, 44/75776
Int. Cl. G09b *9/04;* **A63h** *33/26*
U.S. Cl. 35—11 **26 Claims**

For testing driving skill, a console having the appearance of an automobile hood, includes steering apparatus whereby a miniature vehicle may be guided along a surface of a rotary turntable, using magnetic force in guiding the vehicle.



Turntable speed and direction are controllable by instrument panel elements energized by dry cells within the console.

3,657,458
CHARTING EQUIPMENT
Joseph Kuna, Brighton, England, assignor to Movitex (Signs) Limited, Wembley, England
Filed Jan. 8, 1970, Ser. No. 1,428
Claims priority, application Great Britain, Dec. 18, 1969, 61,641/69
Int. Cl. G09b *19/18*
U.S. Cl. 35—24 B **5 Claims**

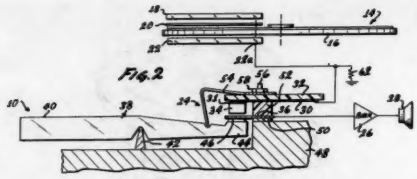


Charting equipment formed from a plurality of slidable panels vertically carried in a frame. Front and rear channels are provided on upper and lower rails in the frame, and the panels normally are positioned in side-by-side relation in the front channels. To move a panel horizontally it is lifted and pivoted from the front channel to be positioned in the back channel and slid behind an adjacent panel.

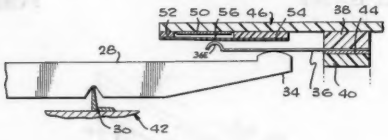
3,657,459
MUSICAL INSTRUMENT WITH VARIABLE AMPLITUDE
Robert L. Peterson, Woodland Hills, and Paul R. Wieman, Hawthorne, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 2, 1970, Ser. No. 86,143
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **1 Claim**

An electronic organ with tone generators that are coupled to a loudspeaker by depressing key-operated switches, wherein each switch provides a resistance dependent upon the pressure applied to the key so that the musician can control the loudness, attack and decay of a musical note. Each switch includes a highly compressible resistance member whose resistance changes greatly with degree of compression,

a first conductor which supports an upper end of the resistance member, and a resilient second conductor normally spaced below the resistance member. Manual depression of a key deflects the lower switch conductor up against the resistance member and compresses it in an amount dependent upon the pressure applied to the key. The fact that the resistance member initially has an extremely high resistance when the first contact touches it, prevents the production of a "popping" sound as the key is depressed.

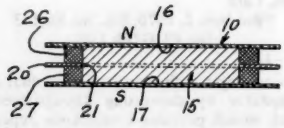


3,657,460
ORGAN KEYBOARD SWITCHING SYSTEM
Stanley Cutler, Van Nuys, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 22, 1971, Ser. No. 108,841
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **8 Claims**



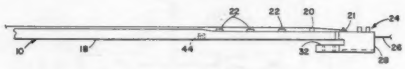
A switch assembly operated by the keys of an electronic organ to connect different tone generators to the loudspeaker, which is simple and which minimizes mechanical and electrical noises during closing of the switches. The assembly includes a row of resilient switch members connected to the loudspeaker and positioned to be individually deflected up against a contact assembly. The contact assembly includes a a circuit board with numerous conductive pads arranged in a row above the row of switch members, a pair of insulating spacer strips extending along either side of the row of pads, and an intermediate strip of conductive plastic fastened to the spacer strips. When a key is depressed, a corresponding switch member is deflected upwardly to press a region of the plastic strip against a conductive pad.

3,657,461
SINGLE PICKUP FREQUENCY CONTROL FOR STRINGED INSTRUMENT
Quilla H. Freeman, 1050 Gardner Street, Hollywood, Calif.
Filed Dec. 21, 1970, Ser. No. 100,137
Int. Cl. G10h *3/00*
U.S. Cl. 84—1.15 **3 Claims**



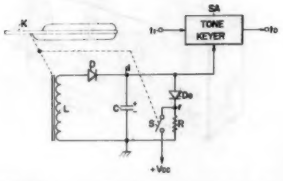
A single pickup frequency control is placed transversely below the strings of an instrument such as a banjo, guitar, mandolin or other vibrating metal instrument. The pickup comprises a bar magnet, the poles of which are situated at the top and the bottom faces thereof. A divider surrounds the magnet transversely of and parallel with the two polar faces of the magnet. Wire coils surround the magnet on each side of the divider plate and the coils are so connected that the electrical path of one coil is clockwise while the electrical path of the other coil is counterclockwise. One end of the top and of the bottom coils leads to an amplifier connected to a loud speaker.

3,657,462
STRINGED MUSICAL INSTRUMENT ADAPTED FOR INTERCHANGEABLE BODIES
Greg D. Robinson, 3406 Darlene Circle, Huntsville, Ala.
Filed Nov. 9, 1970, Ser. No. 88,057
Int. Cl. G10d *1/00;* **G10h** *3/00*
U.S. Cl. 84—1.16 **3 Claims**



A stringed musical instrument such as a guitar wherein the neck assembly is extended to include the bridge and tailpiece, and the body of the instrument and neck assembly are detachable. The end region of the neck assembly supporting tailpiece is made in the form of a U and a cutout region at the rear of the body is adapted to receive the cutout region to form a tongue and groove structural joint between the neck assembly and body of the instrument.

3,657,463
KEYER CONTROL CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENTS
Ryu Hiyama, Hamamatsu, Japan, assignor to Nippon Gakki Suzo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed Nov. 17, 1970, Ser. No. 90,294
Claims priority, application Japan, Nov. 18, 1969, 44/92253; 44/92254; 44/109351
Int. Cl. G01h *1/02*
U.S. Cl. 84—1.26 **7 Claims**



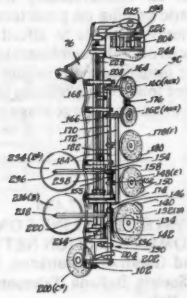
In an electronic musical instrument including playing keys and respectively associated tone keyers, each tone keyer is keyed by a control signal producing circuitry. The control signal producing circuitry comprises a coil inducing an electromotive force responsive to the depressing speed of the associated key having a magnet, a capacitor charged with the induced electromotive force through a first diode, a discharging circuit consisting of a second diode and a resistor, the second diode being connected in the forward direction for a discharging current of the capacitor, and a normally open switch associated with the key and connected between the juncture of the second diode and the resistor and a voltage source for reversely biasing the second diode, wherein the control signal for the tone keyer is derived from the capacitor. This construction prevents the instrument from producing cipher which would otherwise occur due to the failure of closure of the switch which is associated with the key.

3,657,464

MUSICAL WIND INSTRUMENT

Vito Pascucci, Kenosha, Wis., assignor to G. Leblanc Corporation, Kenosha, Wis.

Filed Aug. 21, 1970, Ser. No. 65,920
Int. Cl. G10d 7/00, 7/08
U.S. Cl. 84—380 5 Claims



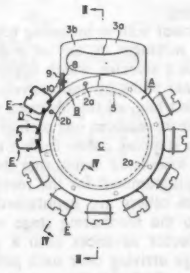
A musical wind instrument of the open tube type such as a saxophone is disclosed herein and includes a hollow body portion having an upstream upper part and a downstream relatively lower part, each part being provided with a plurality of upper and lower tone holes respectively. An upper tone changing sub-assembly, disengageably mounted to the upper part of said body portion includes a plurality of keys and key-cups which are conventionally operated by the fingers of the left hand for opening and closing individual ones or various combinations of the upper tone holes to vary thereby the tonal qualities of the instrument. In like manner, a lower tone changing sub-assembly is disengageably mounted to the lower part of said body portion and includes similar components which are conventionally operated by the fingers of the right hand for opening and closing the lower tone holes.

3,657,465

TAMBOURINE

Yoshiyuki Koishikawa, 2365 Kawarado-cho, Yokkaichi, Japan

Filed Jan. 25, 1971, Ser. No. 109,503
Int. Cl. G10d 13/02
U.S. Cl. 84—418 3 Claims



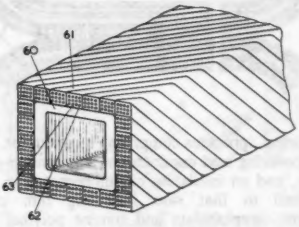
A tambourine comprising a pair of front and back frames made of a synthetic resin and adapted to be mated with each other in interlocking relation, said front and back frames consisting of annular pieces provided with interlocking projections and recesses on the mating surfaces and with annular grooved steps on the outer peripheral surfaces thereof and having halves of a handle integrally formed at portions of the outer peripheral edges thereof, a sheet adapted to be clamped between said annular pieces at its peripheral edge portion and having through-holes perforated therein for engagement with the projections on one of said annular pieces, a strip or ribbon adapted to be fitted on said annular grooved steps formed on the outer peripheral surfaces of the annular pieces of said pair of frames with the opposite ends thereof secured to said handle and a plurality of bells or other sound-generating elements secured to said strip or ribbon at a predetermined interval.

3,657,466

SUPERCONDUCTORS

Alan Woolcock, and Anthony Clifford Barber, both of Lichfield, England, assignors to Imperial Metal Industries Kynock Limited, Witten, Birmingham, England

Filed June 11, 1970, Ser. No. 45,501
Claims priority, application Great Britain, June 19, 1969, 31,083/69
Int. Cl. H01b 7/34
U.S. Cl. 174—15 C 10 Claims



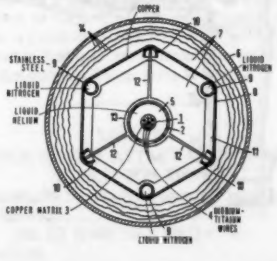
A superconductor assembly comprising at least one superconductor composite of at least one element of a superconductor material which is superconductive below a critical temperature embedded in a matrix of at least one material which is not superconductive at said critical temperature, assembled to at least one component consisting of one or more materials which are not superconductive at said critical temperature to provide a tubular assembly having at least one passage for fluid coolant.

3,657,467

COOLABLE ELECTRIC CABLE

Gunther Matthaus, and Fritz Schmidt, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 8, 1970, Ser. No. 53,229
Claims priority, application Germany, July 25, 1969, P 19 37 796.9
Int. Cl. H01b 7/34
U.S. Cl. 174—15 C 10 Claims



A coolable cable such as a cooled superconductive cable or the like has one or more electric conductors and includes

a conduit concentric therewith for directing a coolant therealong. A plurality of tubes are provided in parallel spaced relation to the electric conductor and a metal band is wound around the tubes and forms a radiation shield. Supporting members are disposed intermediate the conductor and the tubes at respective positions along the longitudinal cable axis for supporting the tubes and the metal band.

3,657,468

ELECTRICAL APPARATUS CONTAINING A GRAFT POLYETHYLENE TEREPHTHALATE-POLYSTRENE INSULATING FILM TO BE USED TOGETHER WITH AN INSULATING OIL

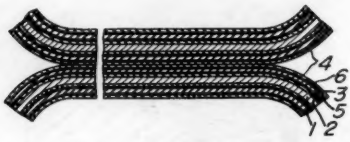
Hideo Tsukioka, and Nobuhiko Shito, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of application Ser. No. 639,882, May 19, 1967, now abandoned. This application Aug. 20, 1970, Ser. No. 65,362

Claims priority, application Japan, June 8, 1966, 41/36506

Int. Cl. C08g *39/10*; **H01b** *3/42*, *7/00*, *17/34*

U.S. Cl. 174—25 **3 Claims**



An electrical apparatus comprising a conductor, an insulating layer covering said conductor which consists of an insulating film, and an insulating oil impregnated in said layer, characterized in that said insulating film consists of polyethylene terephthalate and styrene polymer grafted to said polyethylene terephthalate, an amount of styrene polymer being 10 to 200 percent by weight of said polyethylene terephthalate.

3,657,469

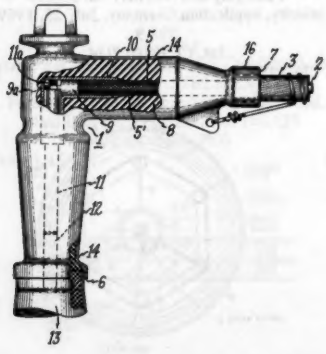
ELECTRIC CABLE TERMINATION MODULES HAVING PEROXIDE-CURED ELASTOMERIC INSULATING BODIES AND A LOW-ELECTRICAL-RESISTANCE CONDUCTIVE COATING ON THE EXTERIOR THEREOF

Raymond B. Ryder, Rochester, N.H., assignor to General Electric Company

Filed May 11, 1970, Ser. No. 36,051

Int. Cl. H02g *15/02*

U.S. Cl. 174—73 SC **14 Claims**



An electric cable termination module is formed of a peroxide-cured ethylene propylene terpolymer that is treated to form carbon-to-carbon cross linked bonds throughout the molecular structure of the elastomer. The peroxide-cured insulating module is characterized by being highly resistant to heat aging so that it retains the resilience necessary to form a water-tight seal with a cooperating cable. Also, this unique insulating material possesses excellent mechanical creep resistance properties that prevent the module from being distorted by mechanical loading over an extended period of time. The termination module is further characterized by the incorporation of an extraordinarily low-resistance, sulfur-curved elastomeric coating on predetermined portions of its interior and exterior surfaces to afford improved electrical shielding characteristics in combination with the desirable properties of the insulating material just identified. The electrical resistance of this coating remains stable when subjected to temperature variations of large magnitude.

3,657,470

CONTROL SYSTEM FOR LINE CONCENTRATOR OF COMMUNICATION NETWORK

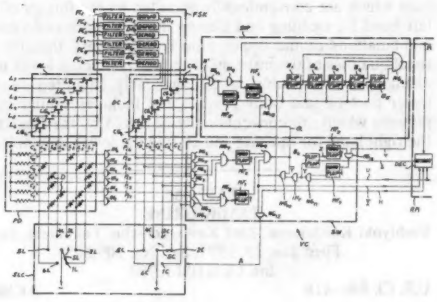
Luigi Sarati, and Gianfranco Battiston, both of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

Filed Oct. 7, 1970, Ser. No. 78,693

Claims priority, application Italy, Oct. 9, 1969, 23122 A/69

Int. Cl. H04l *15/24*

U.S. Cl. 178—3 **12 Claims**



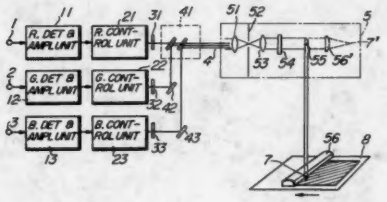
A line concentrator with m incoming telegraph lines, each adapted to carry messages on any of n different frequency channels, includes a selector which cyclically scans all the $m \cdot n$ available signal paths by successively exploring all the channels of the first line, all the channels of the second line and so on, the switchover from one path to the next proceeding in response to stepping pulses from a timing stage under the control of an associated monitoring stage. With some of the signal paths programmed for the reception of messages thereover whereas others are maintained idle, the timing stage transmits to the monitoring stage an enabling signal whenever the selector advances onto a programmed path whereby a message arriving over such path is directed to a multiplex receiver which detects a start and stop code to send a termination signal to the timing stage which thereupon steps the selector. A train of clock pulses, supplied to the timing stage, causes the immediate emission of a stepping pulse to advance the selector if the path is not programmed, and also generates such a stepping pulse in response to a malfunction or nonutilization signal from the monitoring unit produced upon prolonged persistence of the same voltage level on a programmed path.

3,657,471

MULTIPLE OPTICAL SYSTEM FOR COLOR FACSIMILE SYSTEM

Kaoru Sasabe, Ikeda-shi, and Yoshihiro Okino, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan

Filed Sept. 30, 1968, Ser. No. 763,516
Claims priority, application Japan, Oct. 4, 1967, 42/63973
Int. Cl. H04n 5/86, 9/14; G11b 7/00
U.S. Cl. 178—5.4 CD 7 Claims



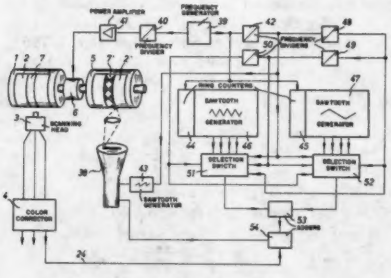
A color facsimile system wherein light beams from three xenon discharge lamps whose intensity of light is modulated by an electric signal corresponding to each component color information transmitted from the sending end are synthesized through respective color filters and said synthesized light beam is focused on a flat photo-sensitive film, the focused bright spot being moved in scanning by means of a vibrating mirror which is electronically driven, thus reproducing the original picture on said flat film.

3,657,472

METHOD AND APPARATUS FOR THE DOT-BY-DOT AND LINE-BY-LINE RASTERED RECORDING OF PICTURE SIGNALS OBTAINED BY SCANNING PICTURE ORIGINALS WITH A RASTER ROTATED WITH RESPECT TO THE RECORDING DIRECTION

Heinz Taudt, Kiel, and Hans Keller, Kiel-Wik, both of Germany, assignors to Dr.-Ing. Rudolf Hell

Filed Jan. 9, 1970, Ser. No. 1,614
Claims priority, application Germany, Jan. 10, 1969, P 19 01 101.9
Int. Cl. H04n 1/06, 1/46, 5/84
U.S. Cl. 178—6.7 R 21 Claims



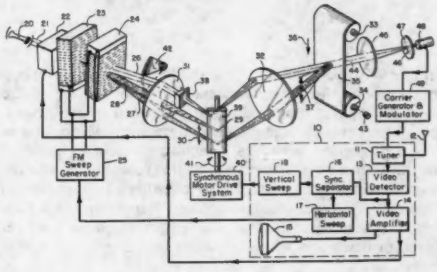
A method of recording dot-by-dot and line-by-line in a predetermined raster structure, picture signals obtained by scanning picture originals, with a raster rotated with respect to the recording direction, the picture signals and the raster signals being superimposed, and repetition, raster being recorded in a finer resolution than the picture content, in which a raster angle of rotation having a rational tangent is employed, produce raster signals which correspond to the structural content of an area, taken from the selected rotated raster, the boundary lines of which lie in the recording and the feed directions respectively, and which contain the fundamental period of the rotated raster structure in each of such directions, i.e., that part of the raster structure extending in the direction involved lying between two raster repetitions, but which does not in itself contain a predetition, with such raster signals being periodically repeated at a frequency adequate for the picture formation. Two forms of apparatus are disclosed for practicing the method, one of which utilizes a simultaneous recording of a plurality of partial lines extending in the recording direction and forming one picture line, and the other of which utilizes a successive recording of partial lines extending transversely to the recording direction and forming one picture line.

3,657,473

HOLOGRAPHIC IMAGE RECORDING AND REPRODUCING SYSTEM

John W. Corcoran, Los Altos, Calif., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed May 15, 1970, Ser. No. 37,555
Int. Cl. G02b 21/18, 27/10; H04n 5/84
U.S. Cl. 178—6.7 A 10 Claims



A holographic image recording and reproducing system for use with a conventional television receiver. A laser beam which is intensity modulated in accordance with video information is projected through a Bragg cell deflection system to provide a scanning image beam. The undiffracted output beam from the Bragg diffraction scanning system is employed as the reference beam. The reference beam and the scanning signal beam are converged by an optical lens system at a Fourier transform plane where a light responsive film is transported. Image data from an entire horizontal scanning line of the TV image is overlapped to provide a single holographic image, and a separate deflection mirror or other deflecting system is provided to sweep the scanning signal beam and the reference beam, still converged, slowly across the width of the even more slowly moving film. For playback, the reference beam component is removed, the film is swept by an unmodulated scanning signal beam following the same scanning pattern as the original recording signal beam, and a photodetector is positioned on a projection of the path of the original reference beam to reconstruct the television signal for playback through the TV receiver.

3,657,474

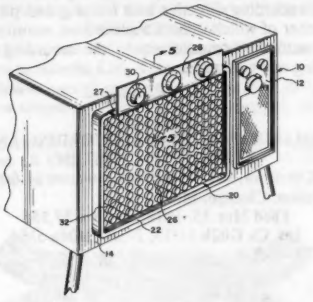
PSYCHEDELIC DEVICE ATTACHABLE TO FRONT OF TELEVISION TUBE

Paul H. Turnrose, 84 Overlook Avenue, Forestville, Conn.

Filed Apr. 13, 1970, Ser. No. 27,614
Int. Cl. H04n 5/72; H01j 61/40
U.S. Cl. 178—7.86 7 Claims

The disclosure describes a psychesthetic device for attachment to a television screen or tube face for the produc-

tion of moving variously colored light patterns for direct or indirect visual observation. The device includes, in one embodiment, a panel of essentially opaque material having a plurality of spaced projections with thin-walled bottoms on the outside with or without a layer of irregular shaped multi-colored translucent panels on the inside of the panel. In one embodiment the panel is pigmented plastic so as to transmit only high levels of light intensity except at the ocular end of the projection where it is thinned in the molding process so as to relatively translucent or transparent to low levels of



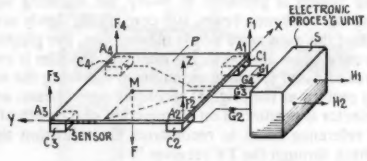
light intensity. Colored light from the television tube, is transmitted through the projections and the color pattern of the transmitted light is modified and transformed by the projections into an ever-changing light pattern with the ocular end of each projection acting as a picture element or point of light diffusion in the pattern. With the room lights and the television sound turned off, the psychesthetic light pattern is produced. The layer of multi-colored translucent panels or colored oculars are used in the combination with either colored or black and white television sets to produce similar effects.

3,657,475

POSITION-INDICATING SYSTEM

Georges Peronneau, La Celle Saint Cloud, and Henr Poizat, Courbevoie, both of France, assignors to Thomson-CSF Visualisation et Traitement des Informations T-VT, Paris, France

Filed Mar. 17, 1970, Ser. No. 20,369
Claims priority, application France, Mar. 19, 1969, 697845
Int. Cl. H04n 1/00
U.S. Cl. 178—18 **8 Claims**



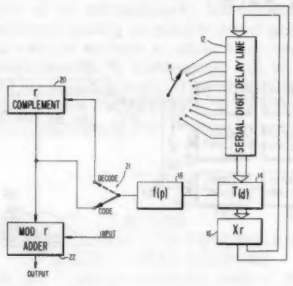
A position-indicating system, determining the coordinates of a point of a surface to which static force is applied, comprises a rigid plate which is fixed to the surface by means of at least three spaced-apart sensors. These sensors delivering each an output signal which is proportional to its distance from the point of application of the force. These signals are then processed in an electronic unit generating two voltages which represent the coordinates of the point of application of the force to the surface, as measured with reference to two axes determined by the three sensors.

3,657,476

CRYPTOGRAPHY

Howard H. Aiken, 1511 South Ocean Drive, Fort Lauderdale, Fla.

Filed Jan. 23, 1970, Ser. No. 5,307
Int. Cl. H04l 9/04
U.S. Cl. 178—22 **21 Claims**



The cryptographic system to be described is based on a unique number theoretical approach to the generation of pseudo-random digits derived from the

$$N = (m - 1)m^{n-1}$$

distinct powers of r modulo M where

$$M = m^n,$$

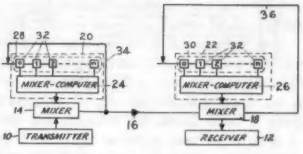
m is a prime, and r is a properly chosen primitive root of m. The digits of the powers of r are transformed into Boolean vectors, and these in turn are used as arguments of a Boolean function employed to generate pseudo-random digits. Subsequently, the pseudo-random digits are combined with digits representing the data to be encoded in a manner facilitating the decoding. Security is provided by the very great periodicy that the invention provides. Known electrical components are arranged in a manner to provide solid state circuitry for the implementation of the cryptographic method.

3,657,477

ARRANGEMENT FOR ENCODING INTELLIGENCE

Kurt Ehrat, Zurich, Switzerland, assignor to Gertag Aktiengesellschaft, Regensdorf am Zurich, Switzerland

Filed Oct. 1, 1962, Ser. No. 227,344
Claims priority, application Switzerland, Oct. 2, 1961, 11409/61
Int. Cl. H04l 9/00
U.S. Cl. 178—22 **6 Claims**



1. For use in an arrangement for encoding intelligence, a code pulse generator comprising a counting pulse supply, a plurality of binary elements constituting at least one counting chain, an output to each of said binary elements, at least one mixing circuit arrangement, an output to the mixing circuit arrangement, and a plurality of inputs to said mixing circuit arrangement, the number of said inputs being substantially

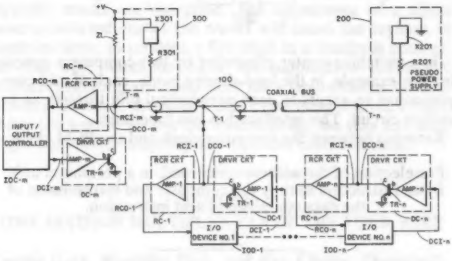
equal to the number of elements in the counting chain and each such input being controllable by a respective output of said binary elements, the mixing circuit including means for converting the state of all its inputs into a predetermined code program appearing at its output, the input of the individual consecutive elements of the counting chain being connected with said counting pulse supply so as to alter its state from counting pulse to counting pulse, and the input of the individual consecutive elements of the counting chain being connected further with the output of every previous element by logic gates which serve to interrupt the changing of the state of any particular stage only when by arriving of a counting pulse the state of all previous elements is "1", and the mode of action of the counting chain being such as to alter from counting step to counting step more than the half of all the elements of the counting chain and to pass the counting chain through all the possible position combinations before returning to its initial position.

3,657,478

INTERCONNECTION BUS SYSTEM

John R. Andrews, Jr., Framingham, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 30, 1969, Ser. No. 889,048
Int. Cl. H04l *25/02*; **H02j** *1/10*; **H03h** *7/38*
U.S. Cl. 178—63 **15 Claims**



In an interconnection bus system, a first impedance network connects at one end of the bus in parallel with a termination provided by a master unit. The termination includes a load impedance for terminating the bus in its characteristic impedance in series with a voltage source for supplying power to the control circuits of a series of devices tapped at different points along the length of the bus. The last device in the series connects to the other end of the bus and includes a second impedance network, complementary to the first, which terminates the bus to ground.

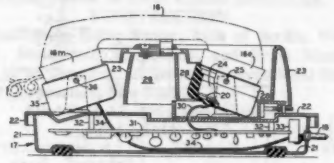
3,657,479

ACOUSTIC COUPLER AND PREAMPLIFIER FOR FACSIMILE MACHINES

Richard E. Sweenie, Champaign, and James M. Griffith, Urbana, both of Ill., assignors to The Magnavox Company, Fort Wayne, Ind.

Continuation of application Ser. No. 774,832, Nov. 26, 1968, now abandoned. This application Nov. 13, 1970, Ser. No. 89,443
Int. Cl. H04m *1/00*
U.S. Cl. 179—1 C **5 Claims**

In a facsimile system, an acoustic coupler is used to connect a facsimile machine through a telephone handset to a telephone line and a remote machine. When a machine is receiving, audible signals at the earpiece of the telephone handset are directed toward a microphone which is wired to the machine. The signal-to-noise ratio of received signals is improved by a preamplifier placed in the coupler as close as possible to the microphone. The preamplifier amplifies the microphone signals before they are subjected to noise or



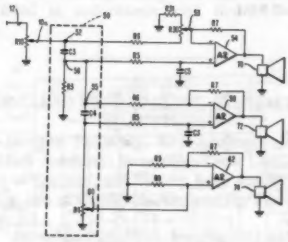
other interference in the wires leading to the receiving machine.

3,657,480

MULTI CHANNEL AUDIO SYSTEM WITH CROSSOVER NETWORK FEEDING SEPARATE AMPLIFIERS FOR EACH CHANNEL WITH DIRECT COUPLING TO LOW FREQUENCY LOUDSPEAKER

Theodore Cheng, 1209 W. Wynnewood Road, Wynnewood, Pa., and James J. Hitt, 73 New Street, Willow Grove, Pa.

Filed Aug. 22, 1969, Ser. No. 852,221
Int. Cl. H03g *5/00*; **H03h** *7/06*
U.S. Cl. 179—1 D **9 Claims**



An audio system in which the audio signal is divided into two or three adjacent frequency ranges by a frequency dividing network having complementary frequency characteristics in the overlapping frequency region and the relative gain of the channels is adjusted for tone control purposes. Each frequency range is amplified by a separate amplifier channel. The output of each amplifier is directly connected to a separate loudspeaker. The low frequency amplifier is a direct coupled amplifier having no reactive elements in its signal path and its output is directly coupled to its associated loudspeaker so that no reactive elements are interposed between the amplifier output and the loudspeaker voice coil.

3,657,481

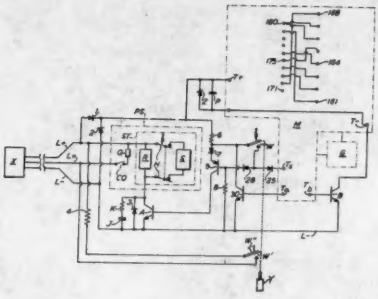
PAY TELEPHONE STATION WITH AUTOMATIC DIALING APPARATUS

Donald V. Di Massimo, Edison Township, Middlesex County, N.J., assignor to G-V CONTROLS Inc., Livingston Township, N.J.

Filed Mar. 17, 1970, Ser. No. 20,188
Int. Cl. H04m *17/02*
U.S. Cl. 179—6.3 R **5 Claims**

At a telephone pay station there is provided automatic dialing apparatus which renders that station usable without the

deposit of a coin therein but only subject to telephone-address limitations imposed by preprogramming of that apparatus.



3,657,482

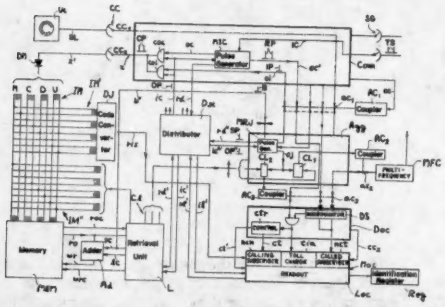
CENTRALIZED IDENTIFICATION AND DEBITING SYSTEM FOR TELEPHONE SUBSCRIBERS

Giorgio Dal monte, Milan, Italy, assignor to Societa Italiana Telecommunicazione Siemens SpA, Milan, Italy

Continuation-in-part of application Ser. No. 728,200, May 10, 1968, now Patent No. 3,591,723. This application Apr. 14, 1971, Ser. No. 133,816

Int. Cl. H04m *15/18*

U.S. Cl. 179—7 MM **10 Claims**



A central memory in a telephone exchange contains, in storage sections assigned to individual subscribers, binary words representing the current balances of their respective accounts together with possible classification information. An input multiple, whose leads are selectively energizable by a line finder in the presence of an incoming call, address the storage section assigned to the calling subscriber and, in the case of the subscribers within a predetermined class, concurrently transmits an identification of this subscriber to a code register via a buffer register under the control of a classification unit. The input multiple also receives, in the case of a toll call, counting pulses from a called subscriber to indicate the amount of the toll to be debited to the calling subscriber, each containing pulse causing the contents of the addressed storage section to be read out and promptly reinscribed after augmentation by one unit; read-out or augmentation in inhibited whenever the energization of the input multiple is due to an interrogation pulse occurring upon seizure of the register. A retrieval unit associated with the memory controls the classification unit and can also be operated, with inhibition of augmentation, for auditing and reclassification purposes.

3,657,483

INTERFACE CIRCUITS FOR A PCM TIME MULTIPLEX SWITCHING CENTER

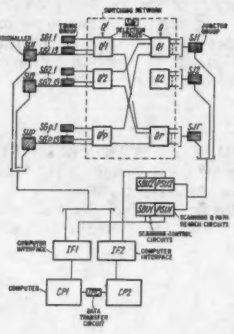
Marc Edgar Marie Bosonnet, Paris, and Michel Andre Robert Henrion, Boulogne-Billancourt, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,913

Claims priority, application France, Apr. 22, 1969, 2540

Int. Cl. H04j *3/00*

U.S. Cl. 179—15 AT **5 Claims**



In a switching center controlled by two computers operating, for example, in the load-sharing mode, each of said computers has an access to each peripherical unit through an interface circuit. This interface has two functions:

Retiming between the computer clock and the PCM clock,

Preselection of the address concerned, in a peripheral unit, by an instruction sent by the computer and transmission of the data contained in said instruction.

3,657,484

DIALING SYSTEMS

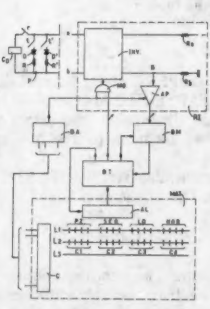
Michel Arnoux, Verrieres-Le-Buisson, France, assignor to C.I.T.-Compagnie Industrielle des Telecommunications, Paris, France

Filed Mar. 6, 1970, Ser. No. 17,208

Claims priority, application France, Mar. 6, 1969, 6906319

Int. Cl. H04m *3/00*

U.S. Cl. 179—16 AA **10 Claims**



The object of the invention is a device for composing a number by means of a keyboard, by impedance variation.

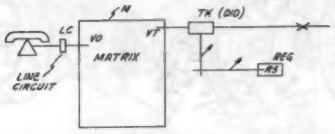
The lines are classified according to at least three categories of impedance, the system comprising means determining

first the category of line measured or the zone and carrying out this measurement of the line impedance as soon as the device comprising measuring apparatus corresponding to the impedance zones and working in parallel, each measuring apparatus comprising comparators adapted respectively to the various categories of lines.

3,657,485
PABX REGISTER FOR ACQUIRING HUNDREDS INFORMATION FROM A TWO DIGIT IN-DIAL

Jose Reines, Glen Ellyn, Ill., and Walter L. Olson, Dunedin, Fla., assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 27, 1970, Ser. No. 32,116
Int. Cl. H04q *3/62*
U.S. Cl. 179—18 EB **8 Claims**

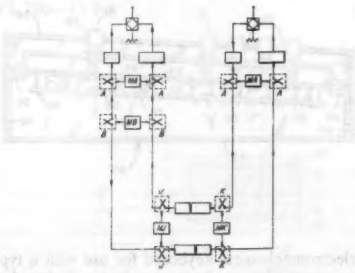


A register circuit in a PABX capable of accepting direct inward dialing is modified to generate hundreds digits when specific trunks are energized. The appearance of a signal over a selected one of the trunks will cause the register, in each instance, to produce a first digit in a hundreds counter. In this way, hundreds digits are supplied to the PABX without requiring an expenditure for a large number of additional selectors in the central office operating into the PABX. After the hundreds have been established, the tens and units digits are routed to appropriate tens and units counters.

3,657,486
TIME DIVISION MULTIPLEX PAX OF THE FOUR WIRE TYPE

George Gara, Wembley Park, and Roy Charles Thorncroft, London, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 9, 1970, Ser. No. 53,573
Claims priority, application Great Britain, July 11, 1969, 35,065/69
Int. Cl. H04j *3/00*
U.S. Cl. 179—18 J **2 Claims**

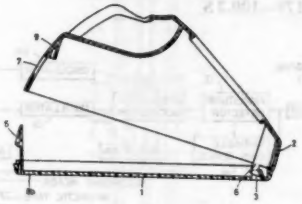


This is a TDM-PAX of the four-wire type, in which the switches for the two directions of speech sample transmissions are physically separate from each other. This separation facilitates arranging the switches so that the proper matching of inter-switch cabling is facilitated. Separate time positions are used within a slot for signalling and speech. Information other than speech is transmitted by varying the width of the crosspoint control pulses.

3,657,487
TELEPHONE SUBSET USING MODULAR CONSTRUCTION

Gunter Schwanck; Heinz Ruster, both of Berlin; Wolfgang Gruger, Stuttgart-Zuffernhausen, and Ernst Manteuffel, Berlin, all of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 12, 1969, Ser. No. 9,460
Int. Cl. H04m *1/02*
U.S. Cl. 179—100 R **8 Claims**

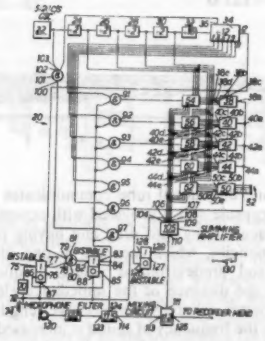


In a table-type telephone subset all of the substantial individual parts such as the base plate, the housing, the cradle-switch, the number-switch, the electric bell or ringer and the bell domes, as well as the base plate of the number switch and the terminal box are provided with hooks shaped thereto, and with corresponding cutouts or indentations, and are assembled in accordance with the known "snap-in" technique.

3,657,488
RECORDING AND REPRODUCING SYSTEM FOR WORK TIME STUDY

Laurence Howard Pountney, 410 Kedleston Road, Derby; Clifford Roy Amsbury, Swarfdale, Trent Lane, King's Newton, both of England, and Stanley John Antliff, deceased, 20 Cole Lane, late of Ockbrook, England (by Freda Antliff, administratrix)

Filed Mar. 28, 1969, Ser. No. 811,681
Claims priority, application Great Britain, Mar. 28, 1968, 14,941/68
Int. Cl. G11b *23/18, 23/30, 27/20*
U.S. Cl. 179—100.1 R **26 Claims**



The invention relates to a work study recording system by which a work study engineer can analyze an operator's performance of a job consisting of a number of operations. The

system has facilities for recording timing signals at the start and finish of each operation; measuring the intervals between successive timing signals and automatically recording the results in coded form; recording additional auxiliary coded information; recording spoken information; and playing back the recorded information.

3,657,489

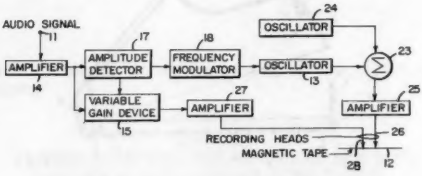
RECORDING INFORMATION AT REDUCED AMPLITUDE AND A SIGNAL INDICATIVE OF THE AMPLITUDE REDUCTION

Melville Clark, Jr., 8 Richard Road, Cochituate, Mass.

Continuation of application Ser. No. 362,014, Apr. 23, 1964. This application Jan. 23, 1970, Ser. No. 5,360

Int. Cl. G11b *5/02, 5/44*

U.S. Cl. 179—100.2 S **16 Claims**



A suitably modulated, but always high level monitor signal is derived from and transmitted with an information signal to control the quantized gains of a transmitter and a receiver in reciprocal fashion to enhance the apparent signal-to-noise ratio of the communication system. The monitor signal controls the quantized gain at the receiver, is of considerably narrower bandwidth than the bandwidth of the information signal, and does not itself introduce noise at the receiver because the monitor signal merely selects which of several gains of the receiver are to be used, in correspondence to the signal-controlled gains of the transmitter which are quantized reciprocally. The system is particularly applicable to tape recordings.

3,657,490

TUBULAR DIRECTIONAL MICROPHONE

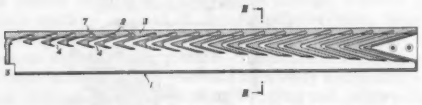
Robert Scheiber, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, Vienna, Austria

Filed Feb. 27, 1970, Ser. No. 15,082

Claims priority, application Austria, Mar. 4, 1969, 2115/69

Int. Cl. H04r *1/34*

U.S. Cl. 179—121 D **15 Claims**



At least one directional tube communicates with a sound transmitter capsule and is provided with acoustic impedance elements spaced along said tube and having predetermined cut-off frequencies, which increase in one direction along said tube, and predetermined natural frequencies, which decrease as the distance of the impedance elements of the capsule increases, whereby the effective length of said tube decreases as the frequency of sound is increased. The spacing and natural frequencies of said impedance elements are selected so that the effective length of said tube is divided into two outer sections and an intermediate section. Said two outer sections have a relatively low sensitivity and are arranged to subject sound received from said impedance elements in said outer sections to mutually opposite phase displacements amounting to approximately $\pi/2$. Said intermediate section has a relatively high sensitivity and is arranged to subject sound received from said impedance elements in said intermediate section to zero phase displacement.

3,657,491

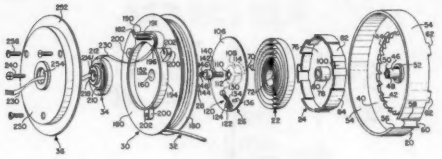
CORD REEL

Francis Eugene Ryder, and Ronald Orville Gordon, both of Chicago, Ill., assignors to Illinois Tools Works Inc., Chicago, Ill.

Filed May 28, 1970, Ser. No. 41,236

Int. Cl. H02g *11/02, 11/06*

U.S. Cl. 191—12.2 **12 Claims**



An automatically retractable cord reel having continuous solid conductors from the free end of the extensible cord through a fixed flat conductor attached to the power source. The fixed conductor is a flat conductor helically disposed and axially restrained within a secondary cavity in the reel with the radially outer end of the flat conductor connected to the cord and the inner end of the flat conductor fixedly connected to the source. Means are also provided to position the reel in predetermined angular relationships to the assembly mounting so that the cord is maintained in an extended condition without tension.

3,657,492

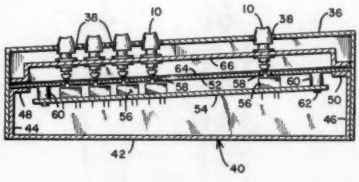
KEYBOARD APPARATUS WITH MOISTURE PROOF MEMBRANE

Allen L. Arndt, Burnsville, and Albert Z. Kaszynski, St. Paul, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 25, 1970, Ser. No. 75,463

Int. Cl. H01h *3/12*

U.S. Cl. 200—5 R **8 Claims**



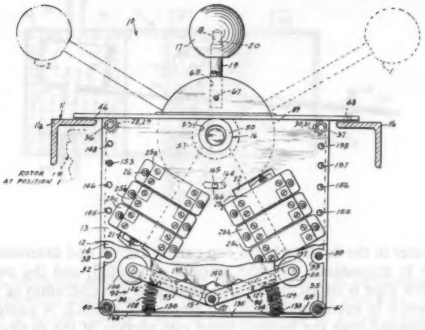
An electromechanical keyboard for use with a typewriter or other computer type data entry device designed to meet stringent environmental specifications. The electrical switches employed on the keyboard are totally enclosed in a metal compartment and are actuated through a deformable membrane such that moisture and dust cannot deleteriously affect the switches. Because the switches are contained within a metal compartment, a high degree of RFI shielding is afforded so that radiated emanations are low.

3,657,493

MOLDED NYLON MASTER SWITCH WITH IMPROVED PIVOTED CAM OPERATOR

Edward A. Horsley, Niagara Falls, Ontario, Canada, assignor to Dominion Bridge Company Limited

Filed Jan. 19, 1971, Ser. No. 107,654
Int. Cl. H01h 3/42
U.S. Cl. 200—6 B 30 Claims



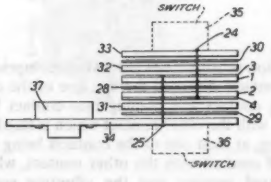
A molded nylon master switch includes a housing of mating, molded housing sections. A plurality of switches are mounted in arcuate patterns on the side walls of the housing sections and operated by a plurality of cams carried on a rotor which is disposed between and journalled to the housing side walls. The rotor is initially manufactured in blank form having a plurality of arcuate ridges on each side which are transformed into cams in accordance with a desired switch operating sequence through the utilization of simple steps of machine forming the individual cams.

3,657,494

PRINTED CIRCUIT SWITCH ASSEMBLY WITH CONDUCTORS OF EQUAL LENGTH

Eric J. Gargini, West Drayton, England, assignor to Communications Patents Limited, London, England

Filed June 2, 1970, Ser. No. 42,674
Claims priority, application Great Britain, June 6, 1969, 28,871/69
Int. Cl. H01h 19/58; H05k 1/04
U.S. Cl. 200—11 DA 2 Claims



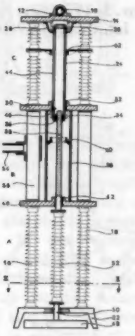
There is disclosed an electrical switch comprising a printed circuit board assembly with replaceable printed boards having conductive screens between a plurality of boards stacked in a support member. Interconnections between boards are made at the edge of the boards.

3,657,495

HIGH-VOLTAGE DISCONNECTING SWITCH WITH SLIDING CONTACT

Pierre Charamel, Les Cotes De Sassenage; Jean Jaillet, St. Egreve; Yves Pelenc, La Tronche, and Maurice Voulat, Grenoble, all of France, assignors to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Apr. 30, 1970, Ser. No. 33,312
Claims priority, application France, May 9, 1969, 12926; Oct. 6, 1969, 34090; Dec. 15, 1969, 43425
Int. Cl. H01h 15/02
U.S. Cl. 200—16 B 17 Claims



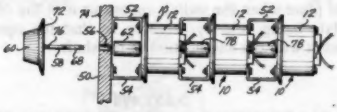
A high-voltage disconnecting switch for establishing an electrical connection between two vertically spaced contacts by means of a movable contact capable of being moved in a vertical translation by a drive mechanism which comprises a threaded drive rod cooperating with an internally threaded element wherein the fixed moving contacts as well as the drive rod are axially arranged in a supporting structure comprising a plurality of superimposed sections defined by transverse plates, the plates of the upper section supporting the fixed contacts and providing guide means for the moving contact.

3,657,496

PERMUTATION SWITCHES

William J. Davidson, Scio, Oreg., assignor to Electronic Controls Corporation, Scio, Oreg.

Filed Oct. 9, 1970, Ser. No. 79,428
Int. Cl. H01h 27/06, 27/10
U.S. Cl. 200—43 13 Claims



A plurality of tumblers located behind a wall are rotated by selective movements of a combination dial to place conductive or dielectric peripheral portions of the tumblers in circuit making or breaking contact with spring contact fingers. The combination dial includes a shaft which is insertable through an opening in the wall into a socket formed in a member forming part of means for rotating the tumblers.

A plurality of such permutation switches are disclosed coupled together in axial alignment so that a single dial operates the tumblers of all switches. The spring contact fingers are mounted on semi-cylindrical carriers which plug into each switch from the rear of the switch. Each switch unit may in-

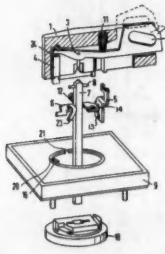
clude two separate sets of spring contact fingers. All switches of a plural switch circuit are disclosed wired in parallel, with each switch performing the same control function and each also operating its own recorder device, so that a record is made with respect to which combination is used as any given period of time.

3,657,497

OPERATING HANDLE FOR USE WITH ENCLOSED SWITCHING APPARATUS

Heinz Homberg, and Georg Weidner, both of Amberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany

Filed Nov. 5, 1970, Ser. No. 87,270
Int. Cl. H01h *9/20*
U.S. Cl. 200—50 A **7 Claims**



An operating handle is provided for use with a switch apparatus enclosed in an enclosure with a door having an aperture. The handle is securable to the door and the switch apparatus has a control shaft extending through the aperture and revolvable to set the switch apparatus between on and off positions. The shaft has a transverse pin at its end portion extending through the aperture. The handle has a housing and a locking lever movably mounted in the housing between locking and non-locking positions for blocking a swiveling of the operating handle. The handle also has a latching plate movable in the housing and having an opening penetrable by the end portion of the shaft when the switch apparatus is in the off position. A control member is connected between the lever and the plate for displacing the plate in response to a movement of the lever to the locking position, the plate being displaced transverse of the end portion of the shaft to prevent the latter from being withdrawable through the opening. There is also a spring connected between the housing and the plate for likewise displacing the plate transverse of the end portion to prevent the latter from being withdrawable through the opening when the switch is in the on position. In addition, a stop securable to the door is provided for holding the plate when the switch apparatus is in the off position, the plate being held by the stop so that the opening is in alignment with the end portion of the shaft.

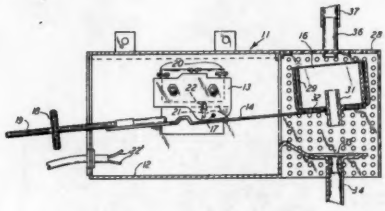
3,657,498

RAIN-RESPONSIVE WATER SPRINKLING SYSTEM ELECTRIC CONTROL

Carl Heindorff, 4839 Sheridan Road, Racine, Wis.

Filed Dec. 28, 1970, Ser. No. 101,517
Int. Cl. H01h *3/02*
U.S. Cl. 200—61.04 **6 Claims**

An electric switch electrically connected to a timer which controls a lawn and gardening watering system. A balance beam operates the switch and has an adjustable weight on one end and a rain receiving cup on the other end such that when a certain supply of rain water is in the cup, the beam is overbalanced to a point where the switch is open and thus the system will not operate to sprinkle water. The cup has an over-flow means in the nature of a stand pipe therein to limit the amount of water and thus limit the time during which the switch can remain open, and the cup also has an evaporating member for assisting in the evaporation of the water collected in the cup. An accumulator cup is disposed remotely of the switch and balance beam cup, and this accumulator cup collects the rain water and directs it to the balance beam cup. The two cups are of the same size so the depth of rain



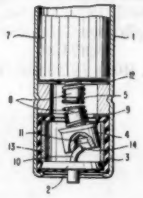
water in the balance beam cup can be known and determined in in accordance with the amount of rainfall, and the overflow pipe is adjustable to also determine the operation of the switch in accordance with the amount of rainfall. A guard is disposed over the balance beam cup section of the device so that the water can evaporate from the cup but bugs, debris, and the like cannot enter the cup to affect the point of balance.

3,657,499

VIBRATION-SENSITIVE ELECTRIC SWITCH

Heinz Gawlick, Furth; Hellmut Bendler, Erlangen-Spardorf, and Gunther Hubsch, Kalchreuth, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation-in-part of application Ser. No. 6,219, Jan. 27, 1970. This application July 31, 1970, Ser. No. 60,049
Claims priority, application Germany, Aug. 1, 1969, P 19 39 247.3
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.45 R **25 Claims**



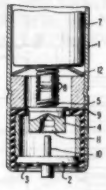
A vibration-sensitive electric switch comprising a housing and two contacts disposed therein, one of the contacts being a vibrating contact and coming into contact by vibrational movement with the other contact which is fixedly arranged in said housing, at least one of the contacts being deformable in the area of contact with the other contact, wherein the fixedly disposed contact and the vibrating contact overlap without contact at at least two points along their axial extension when the switch is in the armed position and wherein the fixedly disposed contact is continuously bent laterally by the vibrating contact when a predetermined accelerative force has been exceeded, whereby the vibrating contact in the deflected condition is in constant contact with the fixedly disposed contact.

3,657,500

VIBRATION-SENSITIVE ELECTRIC SWITCH

Heinz Gawlick, Furth, Bay; Hellmut Bendler, Nurnberg, and Gunter Hubsch, Kalchreuth, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Jan. 27, 1970, Ser. No. 6,219
Claims priority, application Germany, Feb. 4, 1969, P 19 05 295.0
Int. Cl. H01h *35/14*
U.S. Cl. 200—61.45 R 14 Claims



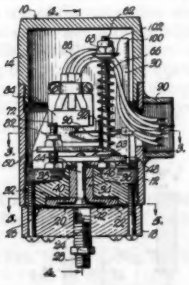
A vibration-sensitive electric switch, for use in percussion or vibration fuses, particularly for hand and rifle grenades, as well as mines, having a pair of contacts, one of which is supported for movement into contact with the other contact in response to application of forces thereto and at least one of said contacts being deformable at least in the area of contact with said other contact so as to increase the contact time therebetween.

3,657,501

PRESSURE ACTUATED DEVICE WITH CONCENTRIC PISTON STEM ACTUATORS

Harold R. Hoyt, Shawnee Mission, Kans., assignor to W. E. Anderson, Inc.

Filed Nov. 23, 1970, Ser. No. 91,979
Int. Cl. H01h *35/34*, *35/24*
U.S. Cl. 200—81.4 5 Claims



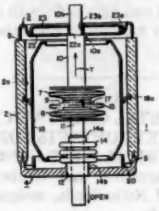
A high proof pressure device for either opening or closing a number of electrical circuits in response to a wide range of changing fluid pressures is provided with a switch for each circuit controlled by a flexible sensor common to concentric, switch actuating piston stems, all contained within a single envelope which is not only tamper proof and explosion proof but capable of protecting its components from adverse weather conditions.

3,657,502

DEFLECTING END-PLATE CONSTRUCTION FOR VACUUM-TYPE CIRCUIT INTERRUPTERS

Sidney J. Cherry, Elmira; Paul O. Wayland, Montour Falls, and Albert Bereza, Elmira, all of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 27, 1969, Ser. No. 811,006
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 B 6 Claims



A vacuum-type circuit interrupter has a generally hollow deflecting end-plate construction involving in one embodiment a pair of spaced metallic diaphragms, so as to be axially resilient during the closing operation of the circuit interrupter, and thereby to absorb the impact stresses during such a closing operation. In one construction, a resilient diaphragm has its peripheral edge sealed to the end wall of the insulating casing, and said diaphragm is reinforced by an annular ring-shaped cup member secured to the first-mentioned diaphragm, and also to the stationary stem portion of the stationary contact or electrode of the vacuum-type circuit interrupter.

A second construction involves the use of a pair of spaced ring-shaped, or annular diaphragm members, which are secured, as by a brazing operation, to the stationary stem portion of the electrode constituting the stationary contact. A pair of inner concentric spacing sleeves may be employed, and an outer sleeve-like member may be secured, as by brazing, to the assembly of the two annular members and also to their outer spacing sleeve. This outer sleeve-like member may also be secured, in sealing engagement, with one end of the insulating casing for the vacuum-type circuit interrupter.

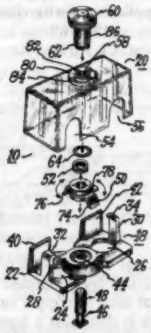
Another embodiment may include a reinforcing diaphragm merely in abutment with the stationary stem. An elastomeric material, such as rubber, may fill the hollow space of the end plate to serve as a damping function.

3,657,503

TERMINAL ENCLOSURE

John A. Smith, Rochester, N.H., assignor to General Electric Company

Filed Aug. 27, 1970, Ser. No. 67,335
Int. Cl. H01h *19/04*
U.S. Cl. 200—155 R 4 Claims



A terminal enclosure for the secondary terminals of an instrument transformer. The enclosure comprises a terminal

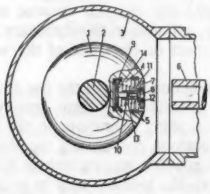
block or securing member mounting on the secondary terminals. The securing or block member is provided with port barriers to bar access to the secondary terminals. A clear plastic box cover is provided made of electrically insulating material which fits over the terminal block member. A thumb nut is held captive in the cover and engages a stud on the securing member to secure the cover to such securing member for enclosing the terminals. A pair of ports are formed in the cover to provide access to the secondary terminals in one position of the cover. A short circuit device is mounted on the stud and interlocks with the cover such that the ports in the cover are barred when the shorting device is in its closed position.

3,657,504

HIGH TENSION METAL CLAD SWITCHES INCLUDING PLUG AND SOCKET CONTACTS FOR ELIMINATING STRONG ELECTRICAL FIELD CONCENTRATIONS

Rintje Boersma, Harmelen, and Gijsbert Waldemar Irk, Bilthoven, both of Netherlands, assignors to N.V. COQ, Utrecht, Netherlands

Filed Aug. 28, 1970, Ser. No. 67,921
Claims priority, application Netherlands, Nov. 5, 1969, 6916683
Int. Cl. H01h *31/32, 33/24, 1/38*
U.S. Cl. 200—163 **7 Claims**



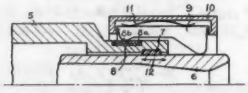
In a metal clad switch for high voltage comprising cooperating contacts to close and to open the circuit, of which one of said contacts is a bushing contact, the provision of a movable metal disc in the cavity of said bushing contact, said disc being forced by a spring in a position, in which it lies flush with the edge of said cavity, when the switch is in its open condition in order to eliminate the unfavourable influence of the edge of said cavity on the electric field set up in the switch when the latter is alive.

3,657,505

ELECTRICAL CONTACTING ARRANGEMENT

Josef Mosele, Obere Brucke, Othmarsingen, Switzerland

Filed Mar. 10, 1970, Ser. No. 18,085
Claims priority, application Switzerland, Apr. 1, 1969, 4943/69
Int. Cl. H01h *1/02*
U.S. Cl. 200—166 C **2 Claims**



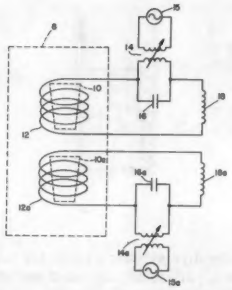
A composite electrical contact structure which includes a laminate of an aluminum layer bonded to a layer of high-grade contact material such as copper or silver onto the aluminum layer of which is then cast a base body of aluminum or aluminum alloy. During casting of the base body, the surface of the aluminum layer is fused by and becomes united with the molten aluminum upon solidification of the latter.

3,657,506

VACUUM COATING SYSTEM WITH INDUCTION HEATED VAPORIZING CRUCIBLES

Arnold J. Aronson, Newton, Mass., assignor to Norton Company, Worcester, Mass.

Filed Feb. 10, 1971, Ser. No. 114,159
Int. Cl. H05b *5/16*
U.S. Cl. 219—10.75 **3 Claims**



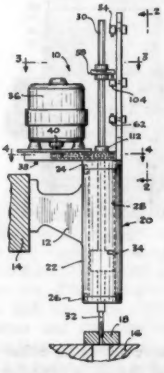
A vacuum coating system having at least two separate induction heated crucibles, the crucibles being sufficiently closely spaced so that there is appreciable coupling between the two separate induction coils surrounding the crucibles. Means are provided for inducing in the tank circuit feeding each induction coil a voltage equal to and opposite to that induced in the coil by the adjacent induction coil.

3,657,507

A VARIABLE SPEED CONTROL APPARATUS FOR USE WITH ELECTRICAL-DISCHARGE-MACHINING, THE CONTROL APPARATUS HAVING AN AUTOMATIC DISABLING FUNCTION

Leonard D. McNeece, Maywood, Ill.

Filed Aug. 18, 1969, Ser. No. 850,775
Int. Cl. B23p *1/14*
U.S. Cl. 219—69 G **1 Claim**



An apparatus for use with an electric-discharge-machine for forming threads in an object wherein a thread tapping device is rotated with respect to the object while the material

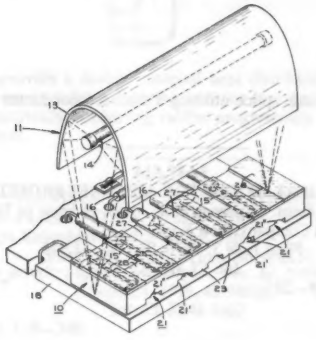
of the object is removed by electrical energy to define a mirror image of the contour of the tapping device, the apparatus being provided with automatic speed varying controls and reversing means to back the device out of the tapped opening when a short-circuit or near-short-circuit obstruction is encountered and to move it back into the opening when the obstruction is removed.

3,657,508

METHOD OF AND RADIANT ENERGY TRANSMISSIVE MEMBER FOR REFLOW SOLDERING

William R. Studnick, Cicero, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Nov. 18, 1070, Ser. No. 90,709
Int. Cl. B23k *1/04*
U.S. Cl. 219—85 **18 Claims**



A radiant energy transmissive member, such as of quartz, is formed with a plurality of peculiarly contoured grooves therein to accommodate, align and facilitate the simultaneous reflow soldering of a plurality of wires or leads to aligned and preferably solder-coated elements, such as circuit path extremities on a printed circuit board. Each groove is contoured such that the solder confined therein, when heated to a molten state, will be drawn at least in part by capillary attraction over the top of the associated wire or lead, with the solder merging on either side with the adjacent element so as to form a reliable fillet-shaped reflow solder connection. Also, by masking one surface of the quartz member so as to be selectively opaque, the radiant energy can be directed more precisely in accordance with a resultant transparent pattern only specific areas to be heated.

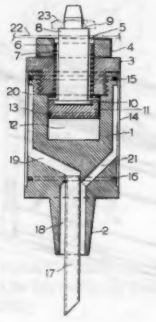
3,657,509

NUT WELDING ELECTRODE

Donald Joseph Beneteau, R.R. 2, Amherstburg, Ontario, Canada

Filed Feb. 16, 1971, Ser. No. 115,217
Int. Cl. B23k *11/30*
U.S. Cl. 219—120 **1 Claim**

A resistance welding electrode for welding nuts or other items which have apertures to parts provided with corresponding apertures, consisting of a main water-cooled body upon which os located an adaptable welding face and containing a sliding pilot pin which passes through and extend beyond the welding face. The nut or the like to be welded is palaced upon the pilot pin, and the part to which it is to be welded is located on the welding face. To weld, the pilot pin is depressed so that the nut is pressed against the part to which it is to be welded. The base of the pilot pin is equipped with a piston which slides within a compression chamber within the main body, so that when the weld is completed



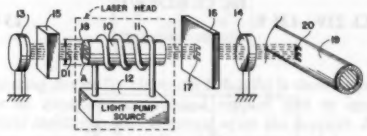
and the pressure on the pilot pin is released, the compressed air in the said chamber returns the pin to its normal position.

3,657,510

Q-SWITCHED LASER DEVICE FOR ALTERING SURFACES

Larry R. Rothrock, Poway, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 19, 1970, Ser. No. 91,024
Int. Cl. B23k *27/00*
U.S. Cl. 219—121 LA **11 Claims**



A high gain optically pumped Q-switched laser device includes a mask having cutout portions defining a given pattern disposed in the resonant optical cavity defined between end mirrors at opposite ends of the laser material. Each of the end mirrors is equivalent to an optically flat reflecting surface such that only cross-sectional portions in the laser material similar to the pattern are stimulated when the Q of the cavity is restored to emit narrow pulses of output laser radiation. These pulses have high power densities and may be directly radiated to a target surface to alter the surface in a manner corresponding to the given pattern. The alteration may take the form of actual vaporization, heating, chemical reaction, or oxidation of portions of the surface. Thus, carefully controlled engraving type processes or other processes involving a physical alteration of a surface such as the drilling of square or unusually shaped holes are determined by the pattern can be carried out.

3,657,511

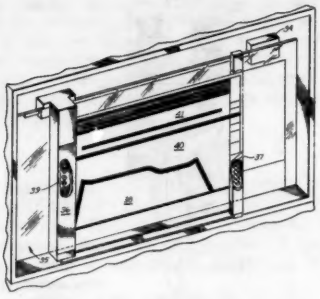
AUTOMATIC WELDING SYSTEM

Robert Friedman, Reseda; Howard D. Lesher, Canoga Park, and Richard K. Burley, Reseda, all of Calif., assignors to North American Aviation, Inc.

Filed Apr. 5, 1967, Ser. No. 628,743
Int. Cl. B23k *9/12*
U.S. Cl. 219—125 **22 Claims**

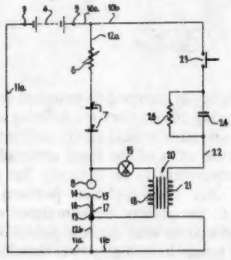
An automatic weld programming system is described which is particularly suited for arc welding and in which a

plurality of photocells is moved across a program sheet positioned on a console screen. The sheet contains coded indicia which cause signals to be generated to automatically control various welding parameters and synchronize various welding



operations to insure that the physical welding manipulations occur in a preselected order and at a programmed rate. In addition, auxiliary system controls are also programmed so that weld environment is precisely controlled before, during and after the welding operation.

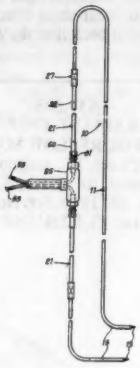
3,657,512
TIP WELDING MEANS
Edward J. Bondarenko, East Brighton, Australia, assignor to Commonwealth of Australia, Melbourne, Australia
Filed Jan. 21, 1970, Ser. No. 4,714
Claims priority, application Australia, Jan. 22, 1969, 49395/69
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 R **13 Claims**



An arc welding apparatus including a first source of electric current able to maintain the arc but unable by itself to initiate the arc, and a separate source of electric current able to apply sufficient voltage to initiate the arc, the first source being connected in parallel with the second source and the arc.

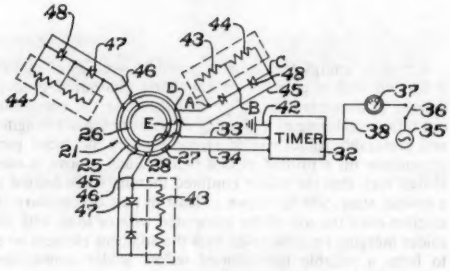
3,657,513
ELECTRICAL HEATING CABLES
Lawrence Howard, Wauconda, Ill., assignor to Jack Hille; Avrum N. Andalman, trustee; Arnold L. Cohen and Avrum N. Andalman, Chicago, Ill., part interest to each
Filed July 22, 1970, Ser. No. 57,230
Int. Cl. B60l *1/02*
U.S. Cl. 219—200 **4 Claims**

An improved junction between the cold section of an electrical heating cable and the input leads, the cold or non-heating section being disposed between the hot section and the input leads. The disclosure relates to a mechanically reliable,



electrically-safe splice utilizing a stranded conductor for the input lead.

3,657,514
ELECTRICAL DEICER FOR AIRCRAFT PROPELLER
Lowell J. Adams, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Filed June 3, 1970, Ser. No. 42,945
Int. Cl. H05b *1/00*
U.S. Cl. 219—201 **7 Claims**

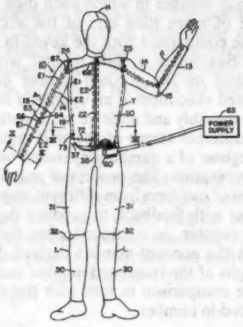


Multiple heater deicer boots for propeller blades having a power source on the aircraft and an electrical connection through brushes and slip rings. Rectifiers are incorporated in the heater circuits and switches are provided for changing the polarity of voltage applied to the two wires connected to the heater circuits so that two brushes and two slip rings provide the electrical connection between the aircraft and rotating propeller for cycling power separately to each heater in the deicer boots.

3,657,515
DIVING SUIT
Norman E. Smith, Annapolis, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 21, 1970, Ser. No. 65,987
Int. Cl. H05b *3/00*
U.S. Cl. 219—211 **8 Claims**

Sections of electrically conducting rubber material are joined together to conform generally to a diver's body. Each section includes an edge portion and a flexible electrode near

the edge portion with the electrode and conducting rubber being coated with a waterproof electrically insulating material.



To provide a desired unequal heat distribution, one embodiment includes a tapering arm (or leg) portion wherein the electrically conducting rubber progressively decreases in thickness.

3,657,516

FLEXIBLE PANEL-TYPE HEATING UNIT

Katsuji Fujihara, Osaka, Japan, assignor to Kansai Hoon Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 30, 1970, Ser. No. 86,151
Claims priority, application Japan, Nov. 10, 1969, 44/106283; Sept. 24, 1970, 45/94016
Int. Cl. F24h *9/02*
U.S. Cl. 219—345 **8 Claims**

A flexible panel-type heating unit in the form of a sealed integral assembly comprising an electrically resistive paper or felt-like porous board having at least one pair of electrodes contacting at its opposite ends. The resistive board and electrodes are sandwiched and sealed by layers of paper or cloth sheets impregnated with a synthetic resin. This new panel-type flexible heating unit has a stable electrical resistance, generates heat uniformly at the entire portions at a desired temperature, automatically maintains the given temperature, allows heating of not only planar but also curved surfaces, and eliminates the provision of temperature-controlling means such as thermostat.

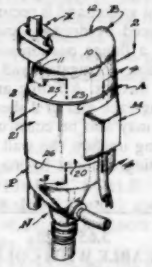
3,657,517

RELEASABLE CLAMP-ON HEATER BAND

Edwin D. Hoyt, Helmet, Calif., assignor to Rama Industrial Heater Co., San Jacinto, Calif.

Filed Apr. 26, 1971, Ser. No. 137,408
Int. Cl. H05b *3/58*
U.S. Cl. 219—535 **9 Claims**

A elongate, flexible, resilient, split-sleeve resistance heater of predetermined cross-section yieldingly, releasably engageable about an elongate part of similar cross-section. Said heater including an inner flexible sheet-like resistance heater element an outer, flexible, sheet-like ground, heat sink and armor screen, longitudinally spaced split band-like forming and gripping springs, flexibly connecting means between the element, screen and a power supply cord and a thermo responsive control switch; the above elements and parts being sandwiched between and sealed within vulcanized together sheets and masses of dialectric, heat resistant silicon rubber compound to be hermetically sealed therein and electrically insulated thereby.

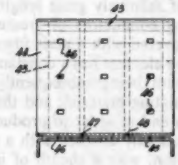


3,657,518

HEATING DEVICE FOR ELECTRICAL ACTUATION

James W. Welsh, Summit, N.J., and Fred Adler, Westbury, N.Y., assignors to Standard Motor Products, Inc., Long Island City, N.Y.

Filed Apr. 14, 1970, Ser. No. 28,326
Int. Cl. H05b *3/06*
U.S. Cl. 219—536 **3 Claims**



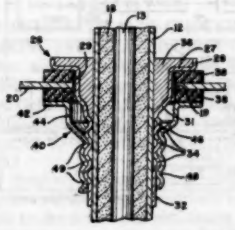
A heating device for electrical actuation is shown which includes an elongated convoluted support and an insulated electrical resistance wire disposed upon the support. A base member optionally underlies the support and is secured thereto. The support may be formed alternatively of a pair of superimposed members, a lateral inturned portion, or a pair of spaced lateral inturned portions or folded portions. Flange portions may also be optionally provided upon the base member for stiffening purposes.

3,657,519

ELECTRICAL HEATING ELEMENT AND FITTING ASSEMBLY

James F. Pease, 1001 View Point Drive, Dayton, Ohio

Filed May 25, 1970, Ser. No. 40,258
Int. Cl. H05b *3/06*
U.S. Cl. 219—536 **7 Claims**



An electrical heating element has an end portion secured to a tubular fitting which extends through an opening within

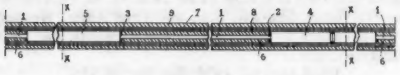
a wall of a liquid heating vessel. The fitting is produced by drawing and deforming a sheet metal disk to form a flange portion and a tubular portion having a corrugated wall configuration defining external threads. The fitting is sealed to the wall by a resilient gasket and is secured by a nut member which is also produced by drawing and deforming a sheet metal disk to form a flange portion and a tubular portion having a corresponding corrugated wall configuration defining complementary threads. A fitting and nut member may be used for attaching each end of a sheath-type heating element to a wall and may also be constructed for mounting a cartridge-type heating unit on the wall. The fitting may be secured to the heating element by magnetically deforming the fitting.

3,657,520

HEATING CABLE WITH COLD OUTLETS

Michel A. Ragault, Bois-Jerome, par 27, Vernon (Eure), France

Filed Aug. 20, 1970, Ser. No. 65,398
Int. Cl. H05b *3/10*
U.S. Cl. 219—553 **7 Claims**



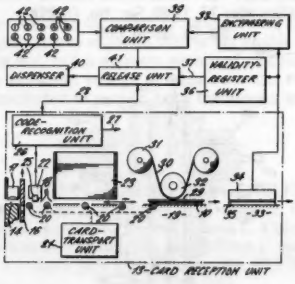
A heating cable with cold outlets, intended mainly for use as immersion heaters and like heating elements, having heating resistance wire of relatively great length having its end brazed to non-heating conductors of greater diameter, the heating wire being covered with a glass fiber braid having a thickness such that the element has a constant cross-sectional dimension, this element being subsequently slipped into a sheath of plastic insulating material, and that said elements are assembled end to end in order to produce a cable of indefinite length subsequently covered with a metal braid and eventually, by extrusion, with a sheath of insulating plastic material.

3,657,521

ACCESS-CONTROL EQUIPMENT AND ITEM DISPENSING SYSTEMS INCLUDING SUCH EQUIPMENT

Geoffrey Ernest Patrick Constable, Cheltenham, England, assignor to Smiths Industries Limited, London, England

Filed Aug. 24, 1970, Ser. No. 66,182
Claims priority, application Great Britain, Aug. 25, 1969, 42,263/69
Int. Cl. G06k *7/01*
U.S. Cl. 235—61.7 B **15 Claims**



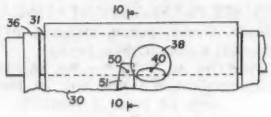
A money-dispensing system is operative to dispense money in response to a bank customer's embossed credit card and keyed-entry of his personal-identification number, only if this number accords with the customer's account number read from an accounting record impressed from the card. The account number is translated by an encyphering unit into a significantly different number in which each digit is dependent upon the value of more than one of the account-number digits, before the comparison with the keyed-in number. The translation involves filling a shift register with binary-encodings dependent on the account-number digits and the results of repeated execution of an operation in which there is programmed assembly and additive combination of pairs of numbers from different stages of the shift register and feed back into the register of a number dependent on the result of the additive combination. The process of assembly and additive combination of numbers from different stages of the shift register, together with feedback to produce derived-number shifting of the register, is continued after the register has been filled with the account-number derived data, so as to generate the digits of the translated number successively and supply these for comparison in turn with the corresponding digits of the keyed-in number.

3,657,522

RECORD FOR MACHINE SCANNING

Ernest Wildhaber, 124 Summit Drive, Brighton, N.Y.

Filed May 12, 1970, Ser. No. 36,610
Int. Cl. G06k *19/00*
U.S. Cl. 235—61.12 N **5 Claims**



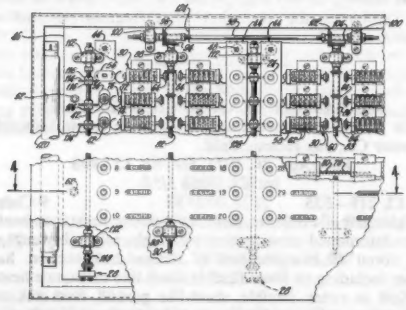
This record for machine scanning contains characters arranged in lines on both sides thereof, front and rear. On one side are conventional characters readily legible with human eyes from left to right. On the opposite side the characters are symbols legible by machine with a minimum of circuitry. The lines of symbols are arranged from right to left, starting at the right, so as to permit simultaneous application of the characters on both sides of the record.

3,657,523

CONTROLLING AND RECORDING APPARATUS FOR A LIQUID DISPENSER

Alonzo R. Clark, 100 Maple Street, and Robert W. Bloom, 108 E. Lynn Street, both of Stryker, Ohio

Filed Feb. 11, 1971, Ser. No. 114,486
Int. Cl. B67d *5/22*
U.S. Cl. 235—94 R **10 Claims**



Apparatus used with a gasoline pump controls operation of the pump and records the amount of gasoline dispensed

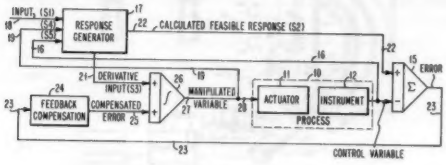
thereby to each of a number of customers or users. Each of the customers has his own key for a specific lock of the apparatus. When the key is turned, a recording device indicates the amount of gasoline dispensed and a switch is closed to ready the gasoline pump for operation when the gasoline nozzle valve is operated by the user. The quantity of gasoline consumed by each customer is periodically noted and the customers are billed accordingly. The apparatus is less expensive to manufacture and, at the same time, is more reliable than devices heretofore proposed for the same general purpose.

3,657,524

DUAL MODE PROCESS CONTROL WITH CONTINUOUS FEEDBACK DURING COARSE MODE

Roger M. Bakke, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 15, 1970, Ser. No. 46,349
Int. Cl. G05b *17/02*
U.S. Cl. 235—150.1 **10 Claims**



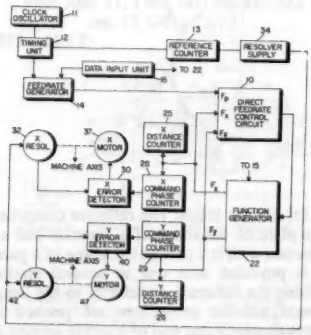
Dual mode process control having a coarse mode employing feedforward to change the process at a time-optimal rate to a new condition, and having a fine mode employing feedback for maintaining the process in the set condition. In coarse mode, a continuous prediction of the response of the controlled variable is made and is compared to the continuous feedback also used in fine mode. Any difference therebetween comprises an error and is employed to alter the coarse mode control of the manipulated variable. Thus, if an inaccuracy exists in the feedforward model of the process or if some outside change should occur to the process while in coarse mode, it is compensated for by adjustment to the coarse mode control of the manipulated variable.

3,657,525

DIRECT FEED RATE CONTROL CIRCUIT

John T. Evans, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 17, 1970, Ser. No. 20,339
Int. Cl. G05b *19/14;* **H02p** *7/42*
U.S. Cl. 235—151.11 **9 Claims**



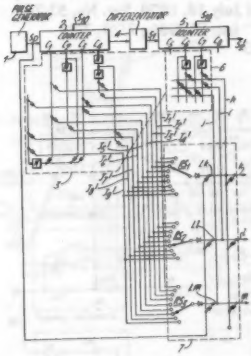
Control of the rate of motion is provided for a numerical control system utilizing a direct feed rate form of programming. Command pulse trains produced for each axis of motion and a velocity command pulse train representing the programmed velocity of the resultant path of motion are applied to a circuit which indicates a difference resulting from subtracting the sum of the squares of the number of pulses in the individual axis command pulse trains from the sum of the square of the number of pulses in the velocity pulse train over a period of time. The difference is used to control the rate of generation of the axis pulse trains so as to approach zero difference.

3,657,526

CALCULATING SYSTEM FOR AN AUTOMATIC WEIGHING SCALE

Kenzi Konisi, Osaka; Katsumi Iwatani, and Yukio Kakizono, both of Kyoto, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 11, 1970, Ser. No. 36,041
Claims priority, application Japan, May 15, 1969, 44/37557; 44/37558
Int. Cl. G01g *19/413;* **G06f** *7/39*
U.S. Cl. 235—151.33 **5 Claims**



A calculating system for an automatic weighing scale wherein a rough estimate of the value of a load being weighed can be made before the scale has come to complete balance. The rough estimate of the value of the load being weighed is renewed as the scale achieves a higher and higher degree of balance.

3,657,527

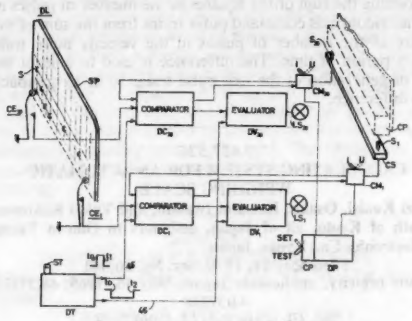
SYSTEM FOR AUTOMATICALLY CHECKING BOARDS BEARING INTEGRATED CIRCUITS

Georges Kassabgi, and Mario Vinsani, both of Milan, Italy, assignors to Honeywell Information Systems Italia S.p.A.

Filed Oct. 16, 1969, Ser. No. 866,804
Claims priority, application Italy, Oct. 17, 1968, 22592 A/68
Int. Cl. G06f *11/00;* **G01r** *15/12*
U.S. Cl. 235—153 **4 Claims**

A system for checking boards bearing integrated circuits, wherein a program card is read automatically to provide both test input signals to the board and simulation output signals representative of the correct output signals which should be delivered by the board in response to the test input signals,

and wherein the actual output signals delivered by the board are compared with the simulation output signals for generat-



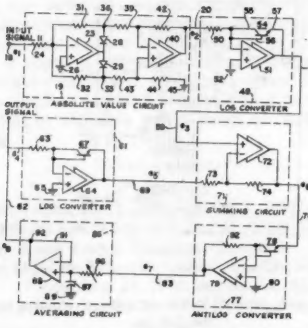
ing indicia representing any defects which may exist in the board.

3,657,528

RMS VOLTMETER AND LOG CONVERTER

Lawrence M. Plante, 6092 Cilmere Drive, Brookpark, Ohio

Filed July 10, 1970, Ser. No. 53,789
Int. Cl. G06g *7/20, 7/24*
U.S. Cl. 235—193 **24 Claims**



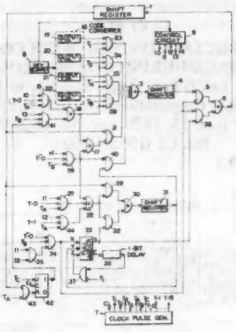
An RMS voltmeter and logarithmic converter using electronic mathematical operators for determining the RMS value and its logarithm of an input signal. A source of electrical signals to be measured is connected to the input of an absolute-value circuit. The output from the absolute-value circuit provides the input to a log converter circuit having an output which provides one of the inputs to a summing circuit. The output from the summing network provides the input to an antilog converter circuit. The output from the antilog converter circuit provides the input to an averaging circuit having its output connected to the input of a second log converter circuit. The output from the second log converter circuit is in circuit with the second input to the summing circuit. One of the two inputs to the summing circuit is scaled by a factor of two to achieve the squaring function required by the converter. In an alternative embodiment, means are disclosed for causing the instrument to operate in either the averaging or in the RMS mode to provide either a linear or logarithmic output. In addition, means are disclosed for selecting the time constant of the averaging circuit to accommodate a wide frequency range for the input signals.

3,657,529

ENTRY MARK SYSTEM FOR ENTRY AND DISPLAY OF NUMBERS

Goro Hamano, Osaka-fu, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Jan. 26, 1970, Ser. No. 5,494
Claims priority, application Japan, Jan. 31, 1969, 44/7927; 44/7928; Mar. 3, 1969, 44/16052
Int. Cl. G06f *7/38, 3/00*
U.S. Cl. 235—159 **7 Claims**



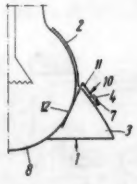
A calculator having an input register for receiving an input number, an auxiliary register and a decimal point position memory for storing numerical data and showing the number of digits below the decimal point position. Entry mark setting means are provided to set all 1's signals into the "one's" digit position of the auxiliary register corresponding to the contents of the decimal point position memory. Additional means are provided to set code bits specified by a keyboard into the same digit position of the input register as that of the entry mark consisting of all 1's signals in the auxiliary register by using the entry mark as a time slot signal for number entry.

3,657,530

REFLECTOR FOR ELECTRIC LAMPS

Eero Halonen, Ulvilantie 10 A 14, Helsinki 35, Finland

Filed June 26, 1970, Ser. No. 50,020
Int. Cl. F21v *7/00*
U.S. Cl. 240—104 **3 Claims**

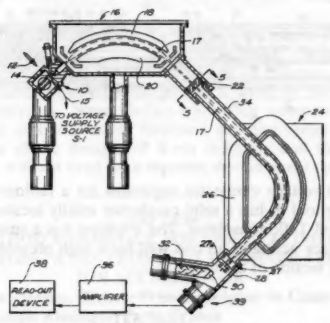


Reflector for electric lamps. The reflector comprises a part of aluminum plate of the shape of a truncate ball segment, and in connection with it a part of the shape of a paraboloid, and which is provided with one or several elastic fixing means for fixing the reflector detachably to the lamp-globe. One or several nail-like projections are pressed into the reflector, through which one end of a spring serving as fixing means is brought, while the other end protrudes from the inside surface of the reflector, so as to press against the lamp-globe.

3,657,531
BEAM CORRECTING DEVICE FOR MASS SPECTROMETERS AND METHOD OF OPERATION

Sydney Evans, Sale, and Reginald Graham, Wilmslow, both of England, assignors to Associated Electrical Industries Limited, London, England

Filed May 15, 1970, Ser. No. 39,240
Claims priority, application Great Britain, May 16, 1969, 25,109/69
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 ME 10 Claims

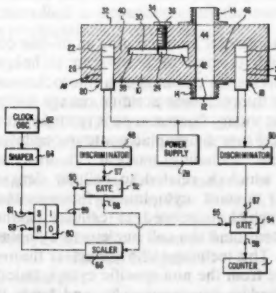


A beam correcting device which may be utilized with mass spectrometers for altering the configuration of the beam of ions passing through the mass spectrometer. The beam altering device may include at least four electrodes disposed at substantially equal positions around the beam of ions and positioned at substantially a point along the beam at which the beam is of a minimum thickness. An electrical control circuit is coupled to the electrodes for applying at least four electrical signals, each of a predetermined value, to the electrodes to establish an electrostatic field about the beam of ions. By varying the potentials applied to the various electrodes, a beam having an arcuate cross-sectional configuration may be altered to produce a beam having a generally rectangular cross-sectional configuration thereby compensating for the effect on the beam caused by undesirable fringing fields.

3,657,532
COMPENSATED NUCLEAR DENSOMETER AND METHOD

Carl W. Zimmerman, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Apr. 11, 1969, Ser. No. 815,333
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 D 12 Claims

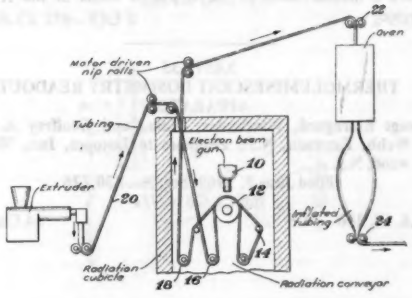


Method and apparatus for compensating a digital nuclear densometer for decay in the intensity of the radiation source, drift and instability of the detectors, temperature and other factors. A common source of radiation is used to irradiate separate detectors through substances of known and unknown density and a ratio between the number of pulses in the output signals of the detectors taken to compensate for conditions common to both detectors. The detectors are energized by a common source to minimize drift and instability and a circuit is provided for digitally linearizing the relationship between the number of pulses in the output signal and the density of the substance under investigation.

3,657,533
PLASTIC TUBING ELECTRON IRRADIATION APPARATUS WITH ROLLER MEANS TO FLATTEN THE TUBING DURING IRRADIATION

Frank W. Spillers, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Original application Apr. 18, 1967, Ser. No. 631,793, now abandoned. Divided and this application July 14, 1969, Ser. No. 859,604
Int. Cl. H01j *37/00*
U.S. Cl. 250—49.5 TE 4 Claims



A process and apparatus for irradiating plastic tubing such that the dosage imparted to the tubing is uniform as to depth and area. The tubing is passed to a flattening zone, then to an irradiation zone, then reversed, inverted, and the sequence is repeated a plurality of times. The flattening zone comprises a flat roller or equivalent means. The irradiation zone comprises an electron beam gun or an equivalent irradiation source. The reversing and inverting is accomplished by a series of wheels and guide rollers arranged adjacent to the flat rollers.

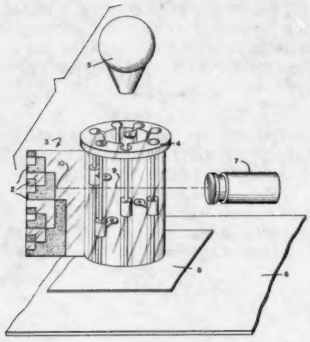
3,657,534
DIGITAL SCALE FOR TOMOGRAPHY AND METHOD OF USING SAME

Joseph L. De Clerk, Red Bank, and Martin Weinstock, Long Branch, both of N.J., assignors to The United States of America as represented by the Secretary of the Army

Filed Mar. 12, 1970, Ser. No. 18,981
Int. Cl. G03b *41/16*
U.S. Cl. 250—59 6 Claims

A test object for measuring the depth of focus of an X-ray exposure. The test object is comprised of a planar surface of X-ray transparent material on which are positioned a coded array of X-ray opaque elements. In use, the test object is an-

gularly inclined to the X-ray field so that the number of coded elements in focus in the resulting X-ray exposure provides a measurement of the depth of focus of the X-ray device.

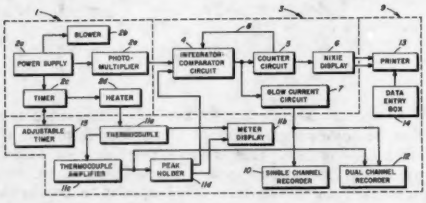


3,657,535

THERMOLUMINESCENT DOSIMETRY READOUT APPARATUS

Bengt Bjarngard, Winchester, Mass., and Geoffrey A. M. Webb, Emerson, N.J., assignors to Isotopes, Inc., Westwood, N.J.

Filed June 5, 1969, Ser. No. 830,726
Int. Cl. G01t 1/11
U.S. Cl. 250—71.5 **14 Claims**



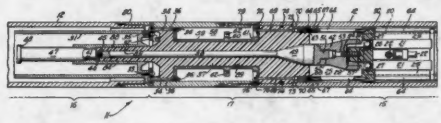
A thermoluminescence dosimetry readout system adaptable to different applications and comprising a basic thermoluminescent dosimetry readout apparatus in which a dosimeter is heated by a strong alternating current to emit thermoluminescent light. The light flux is converted to an electric current which is converted to a pulse train. The pulse train is counted by a four decade counter and the result, which is proportional to the integrated signal, is displayed on Nixie tubes. Numerous accessories form part of the system and comprise a thermocouple to contact the heating element during heating for indicating its temperature; recorders to record the light flux and temperature patterns; a printer to print identifications, Nixie displays and peak temperatures; and means for entering the identifications. The accessories may be used in numerous combinations to provide systems for various applications.

3,657,536

HIGH VOLTAGE CONNECTOR FOR A NEUTRON GENERATOR COMPRISING A PLASTIC INSULATOR

Obie M. Langford, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,866
Int. Cl. G21g 3/00
U.S. Cl. 250—84.5 **8 Claims**



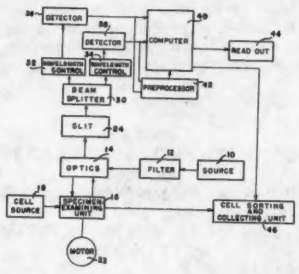
High voltage connector apparatus for a radioactivity well logging tool. It has a solid conductor axially located within a moulded Teflon insulator. The insulator has a smooth transverse face acting as an end wall for a high pressure gas-containing section of the tool.

3,657,537

COMPUTERIZED SLIT-SCAN CYTO-FLUOROMETER FOR AUTOMATED CELL RECOGNITION

Leon L. Wheeless, Jr., Webster, and Stanley F. Patten, Jr., Penfield, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Apr. 3, 1970, Ser. No. 25,336
Int. Cl. G01t 1/16
U.S. Cl. 250—71 R **12 Claims**



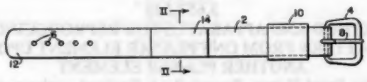
A cyto-fluorometer incorporating an on-line computer provides, through the use of a slit-scan technique, averaged graphic fluorescence contours of a fluorochromed cell. Cells stained with fluorochrome acridine orange are passed under a slit, and secondary fluorescence is recorded at two separate wavelengths. From the graphic contours, cellular parameters are available including nuclear fluorescence at one wavelength which is related to cellular deoxyribonnucleic acid (DNA) content, cytoplasmic fluorescence at another wavelength which is related to cellular ribonnucleic acid (RNA) content, and the cell nucleus to cytoplasm size ratio (N/C ratio). This technique allows nuclear fluorescence to be distinguished from the non-specific cytoplasmic fluorescence often observed in squamous cells, and lends itself to high speed flow-through analysis for the pre-screening of cellular samples for abnormal cells.

3,657,538

METHOD AND APPARATUS FOR DETECTING X-RAY RADIATION USING A CHOLESTERIC DETECTOR

James L. Fergason, Kent, Ohio, and Newton N. Goldberg, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 22, 1968, Ser. No. 754,582
Int. Cl. G01f 1/08
U.S. Cl. 250—83 23 Claims



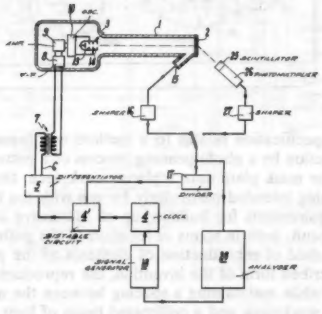
Increasing dosages of X-ray radiation progressively lower the color-play range of cholesteric-phase liquid-crystal materials. The effect is enhanced when an effective amount of an iodine-containing compound is used in the liquid-crystal material. Novel iodine-containing compounds are described, and articles are disclosed that give direct-reading indication of the dosages of X-ray radiation that they have received, without need for a separate development operation.

3,657,539

METHOD AND DEVICE FOR MODULATING OR STABILIZING A NEUTRON FLUX OBTAINED FROM AN ION ACCELERATOR

Alexandre Pierson, Biviers, France, assignor to Commissariat A L'Energie Atomique, Paris, France

Filed June 16, 1969, Ser. No. 833,346
Claims priority, application France, June 28, 1969, 157055
Int. Cl. G01t 3/00
U.S. Cl. 250—83.1 9 Claims



A method and device for modulating or stabilizing a neutron flux obtained by bombarding a suitably charged target with nuclear particles which are produced in a pulsed form. The pulsation frequency of the particle source is modulated or stabilized and the duration of the pulsations of said source is controlled in dependence on the measurement of the neutron production rate of the target.

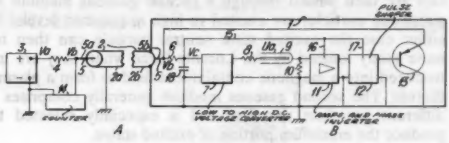
3,657,540

NUCLEAR RADIATION MONITORING DEVICE WHEREIN A DETECTOR, A REMOTE SOURCE AND A MEASURING DEVICE ARE CONNECTED BY A SINGLE CABLE

Jean-Paul Maillot, Meudon, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Oct. 3, 1969, Ser. No. 863,475
Claims priority, application France, Oct. 24, 1968, 171196
Int. Cl. H01j 39/10
U.S. Cl. 250—83.3 R 4 Claims

A nuclear radiation monitoring device wherein a detector and a remote source and measuring device are coupled by a single coaxial cable via a resistor. The detector includes a Geiger-Muller counter tube, a low-to-high D.C. voltage converter, a pulse shaper and a monostable pulse repeater. The remote source supplies a low D.C. voltage which is converted to a high D.C. voltage for use by the detector. Signal pulses from the detector reach the remote measuring device substantially without alteration due to the aforementioned resistor which is chosen to have an impedance equal to the characteristic impedance of the coaxial cable.

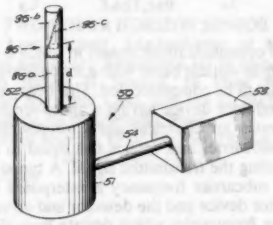


3,657,541

METHOD FOR ASSAYING RADIOACTIVITY OF A RADIONUCLIDE

Marshall E. Deutsch, Sudbury; Louis W. Mead, Lexington, and Zoltan Nagy, Quincy, all of Mass., assignors to New England Nuclear Corporation

Original application Nov. 16, 1966, Ser. No. 594,713. Divided and this application Aug. 4, 1969, Ser. No. 870,764
Int. Cl. G01t 1/20
U.S. Cl. 250—83.3 R 2 Claims



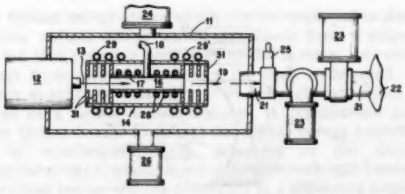
This invention relates to the generation and testing of radionuclides, and more particularly, to the generation and testing of radionuclides for use in nuclear medicine.

3,657,542

PRODUCTION OF BEAMS OF EXCITED ENERGETIC NEUTRAL PARTICLES

Archer H. Futch, Jr., Livermore, Calif., and Robert H. McFarland, Rolla, Mo., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 4, 1970, Ser. No. 34,282
Int. Cl. H01j 37/00
U.S. Cl. 250—84 4 Claims



Excited energetic neutral particle beams are produced, in accordance with one method, by directing a low energy ion

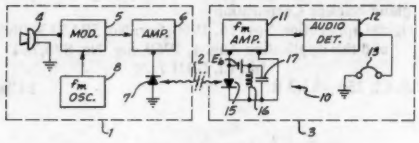
beam through a gaseous medium under thick target conditions. In accordance with a second method, the low energy ions, i.e., below 10 KeV, are directed through a first selected gaseous medium at which resonance or near resonance charge exchange neutralization occurs and the neutral particles are then passed through a second gaseous medium in which the particles are excited to high *n*-quantum levels. In either case the excited state neutral particle can then be more easily ionized by the Lorentz force when they are introduced into a magnetic containment field to form a plasma therein. The second gaseous medium generally comprises a different gas than the first and is especially selected to produce the maximum portion of excited states.

3,657,543

OPTICAL COMMUNICATIONS SYSTEM WITH IMPROVED BIAS CONTROL FOR PHOTOSENSITIVE INPUT DEVICE

Edward A. Rose, Cupertino, Calif., assignor to Optronix, Inc., Santa Clara, Calif.

Filed July 24, 1968, Ser. No. 747,383
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 **8 Claims**



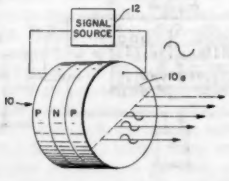
An optical communications system in which a subcarrier is impressed on an optical beam with a modulation representative of a signal to be communicated. This beam is intercepted by a semiconductor device having a photo-sensitive junction which generates an electrical signal representative of the modulated subcarrier and applies this signal to a demodulator for detecting the transmitted signal. A tuned circuit resonant at the subcarrier frequency is interposed between the semiconductor device and the detector and serves as a rejection filter for frequencies which deviate from the subcarrier frequency by more than the bandwidth of the transmitted signal. A back bias is applied to the photo-sensitive junction of the semiconductor device through a low resistance path of the tuned circuit so that the back bias does not vary substantially with variations in the intensity of optical radiation intercepted by the semiconductor device.

3,657,544

SCRAMBLED-PHASE LIGHT SIGNALLING DEVICE

Karl O. R. Scholdstrom, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden

Filed Nov. 12, 1969, Ser. No. 875,633
Claims priority, application Sweden, Nov. 15, 1968, 15499/68
Int. Cl. H04b *9/00*
U.S. Cl. 250—199 **6 Claims**



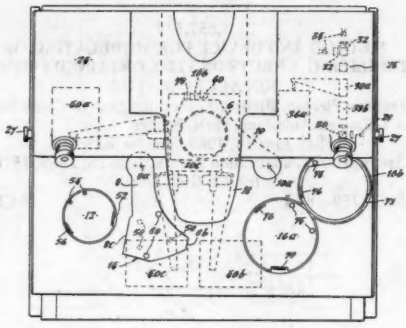
A corrective device is provided for modulated light transmitters or receivers having light-emitting or light-responsive surfaces for which the modulation phase varies over the surface. The device eliminates any systematic error which may occur where only a portion of the surface is active by providing random reorientation of the transmitted or received light beam, the device taking the form of a multi-path translator wherein light conductors connect points on the input surface of the translator to randomly distributed points on the output surface.

3,657,545

METHOD AND APPARATUS FOR REPRODUCING A PATTERN FROM ONE PLANAR ELEMENT UPON ANOTHER PLANAR ELEMENT

Douglas Favel Horne, Beaconsfield, England, assignor to The Rank Organization Limited, London, England

Filed Oct. 24, 1968, Ser. No. 770,250
Claims priority, application Great Britain, Oct. 27, 1967, 49,009/67; Apr. 19, 1968, 18,746/68
Int. Cl. G01j *1/20*
U.S. Cl. 250—201 **16 Claims**



The specification relates to a method and means for the reproduction by a photo-printing process of a pattern from a master or mask plate onto a planar workpiece, the arrangement being intended particularly for use with the high accuracy requirements for building up of successive layers of a microcircuit, both in terms of location of the pattern and in the standard of reproduction of elements of the pattern. In the described form of the invention, the reproduction is performed while maintaining a spacing between the mask plate and the workpiece and a collimated beam of light is used to expose the workpiece to the mask plate pattern. Photo-electric microscope means provide a suitably precise form of automatic location to ensure that successive layers of the microcircuit can be applied in register with each other and approximate location means are combined with a transfer mechanism for loading the mounting devices. The mounting devices are capable of relative adjustment for alignment of the fiducial marks on the elements, for varying the spacing of the elements and for correcting non-parallelity between the adjacent faces of the elements.

3,657,546

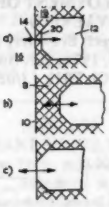
LINE FOLLOWER EQUIPPED WITH MASK TO MAKE EDGE OF SILHOUETTE APPEAR AS A LINE

John R. Bradley, Chesham, England, assignor to The British Oxygen Company Limited, London, England

Filed Jan. 27, 1970, Ser. No. 6,236
Claims priority, application England, Feb. 3, 1969, 5,689/69
Int. Cl. G06k *11/02;* **H01j** *3/14*
U.S. Cl. 250—202 **9 Claims**

A photoelectric line follower is enabled to follow silhouette patterns by positioning a mask partially in the sight

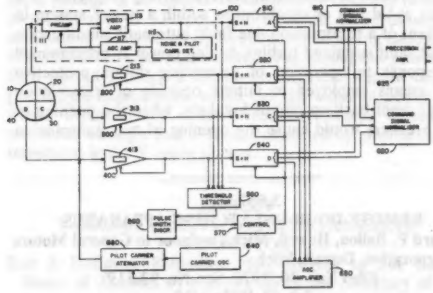
area of the follower. The mask blanks out a portion of the silhouette, leaving only an unobscured, linear portion to function as a 'virtual' line in guiding the follower.



3,657,547
MONOPULSE GAIN BALANCED AMPLIFICATION SYSTEM USING PILOT CARRIER TECHNIQUES

Gerald R. Mansfield, Raleigh, N.C., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 20, 1971, Ser. No. 107,964
Int. Cl. G01j *1/20*
U.S. Cl. 250—203 R **10 Claims**

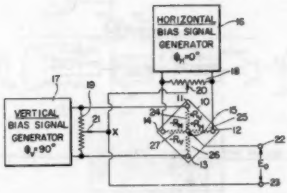


A monopulse type receiver utilizing pilot carrier techniques for providing precise angular error information. Four detector cells are arranged in a quadrant configuration for detecting pulses of laser energy, with the output from each cell being delivered to a respective video channel. Each video channel comprises amplification circuitry including an inner loop automatic gain control (AGC) which operates both on noise and the pilot carrier signal to ensure uniformity of response for each video channel. The video channel outputs are fed into respective sample and hold circuits which provide voltage amplitude outputs both to an outer AGC loop and to a pair of command signal normalizer circuits. The outer AGC loop raises or lowers the gain of each of the video channels as required by controlling the amount of pilot carrier signals interjected into the front of the system. The outputs of the normalizer circuits represent ratios of the energy difference in the four channels divided by the sum of the energies of the channels to provide the desired angular information to a gyro head or the like. Pulse presence determination circuits are also provided in order to reject pulses wider than would be expected.

3,657,548
TRACKING SYSTEM

William J. Parkin, Natick, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Jan. 23, 1963, Ser. No. 253,504
Int. Cl. G01s *3/78*
U.S. Cl. 250—203 R **13 Claims**

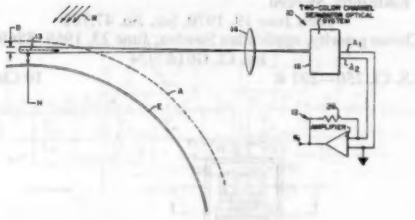


Biasing means are coupled to a radiation responsive, variable impedance detector element to provide a swept sensing apparatus for producing an indication of the presence and location of a remote source of radiation or target without mechanically moving parts.

3,657,549
TWO-COLOR HORIZON SENSOR

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration in respect to an invention of; Harold H. Seward, 16 Frost Street; Mark Gorstein, 60 Spy Pond Lane, and Ian G. McWilliams, 19 Eastern Avenue, all of Arlington, Mass.

Filed May 21, 1970, Ser. No. 39,344
Int. Cl. H01j *39/12*
U.S. Cl. 250—209 **25 Claims**

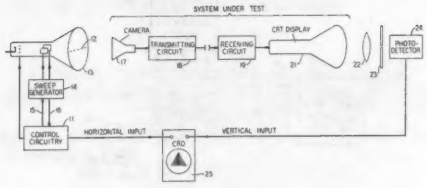


A radiant energy sensor which may be employed to detect discrete radiant energy wavelength bands from a selected portion of a radiating body such as the horizon. As radiant energy from various portions of the body is detected, the energy is analyzed according to its color characteristics by means of a double monochrometer. A combination lens-prism system is used to refract the radiant energy according to its wavelength. Photo detectors in the double monochrometer respond to two selected wavelength bands of the radiant energy and are connected to a difference amplifier to determine the null output of the two detectors. The null condition is adjusted to correspond with the discrete wavelength bands to be sensed.

3,657,550
APPARATUS FOR MEASURING THE SPATIAL RESPONSE OF OPTICAL SYSTEMS

Earl Franklin Brown, Piscataway, and William Kaminski, Hunterdon, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Apr. 7, 1970, Ser. No. 26,292
Int. Cl. G01r *31/22*
U.S. Cl. 250—217 CR **20 Claims**

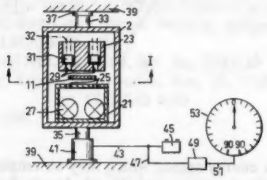


To measure the spatial response characteristics of optical systems, control circuitry is provided to electrically generate a predetermined one-dimensional spatial waveform (e.g., sinusoidal) on the display screen of a cathode ray tube. The optical system to be tested (e.g., a television system) is placed between the spatial waveform display and a suitable detector which comprises a mask having a narrow slit followed by a photomultiplier. The output of the latter is then displayed on an oscilloscope, or measured in some other known fashion. A linear light modulation is achieved for the spatial waveform display by gating a linearly scanned electron beam with constant amplitude, constant duration, variable duty cycle pulses. Appropriate waveforms can be selected to evaluate the spatial frequency response, transient response, linearity, or steady state response of the optical system under test.

3,657,551
SYSTEM FOR SENSING AND INDICATING THE SET INCLINATION OF AN OBJECT

Birger Valdemar Lingert, and Axel Sture Lindblom, both of Eskilstuna, Sweden, assignors to AB Bolinder-Munktell, Eskilstuna, Sweden

Filed June 19, 1970, Ser. No. 47,792
Claims priority, application Sweden, June 23, 1969, 8868/69
Int. Cl. G01d *5/34*
U.S. Cl. 250—231 R **10 Claims**

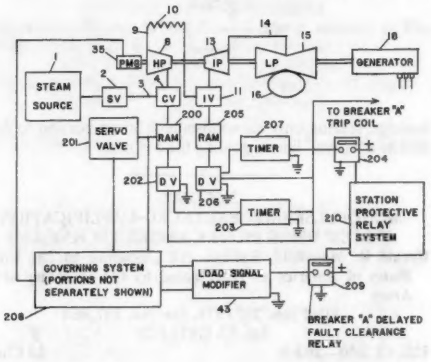


A system for sensing and indicating the angle at which a vehicle-carried implement is inclined to a horizontal line, including a transmitter mounted on the implement and having a pendulum swingable in a housing, said housing being pivotable by remote control with respect to said implement. The transmitter further has light radiating and light sensing means variably screened by a shield on said pendulum to produce a signal depending on the inclination from the vertical of the pendulum housing, and thus characterizing deviation or correspondence between the actual implement inclination and the desired implement inclination, which is adjustable by pivoting the pendulum housing.

3,657,552
METHOD FOR EMPLOYMENT OF FAST TURBINE VALVING

Robert H. Park, Main Street, Brewster, Mass.

Filed June 1, 1970, Ser. No. 42,281
Int. Cl. F01k *13/02*
U.S. Cl. 290—40 B **2 Claims**

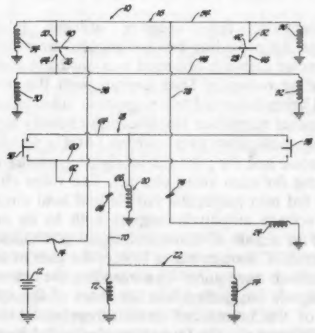


In a process of fast steam turbine valving employed as a way to avoid loss of synchronism within a power system in the event of a transmission line fault, automatic modification of post fault sustained turbine driving power is programmed in response to operation of generating station protective relay means employed to initiate opening of transmission voltage level back-up circuit breakers, when the opening of such breakers would cause the opening of two transmission lines.

3,657,553
REMOTE DOOR UNLATCHING APPARATUS

Richard P. Ballou, Howell, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1970, Ser. No. 93,519
Int. Cl. H02g *3/00*
U.S. Cl. 307—10 **5 Claims**



Apparatus for unlatching the passenger door of a vehicle from the driver's side of the vehicle by placing a door lock

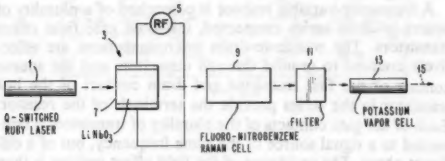
switch in a door unlocking setting while a driver's side door is open. On opening the driver's door a relay effects energization of seat unlatching solenoids to facilitate ingress and egress of passengers. In the door unlocking setting the switch energizes solenoids which unlock the vehicle doors and, with the driver's side door open, effects energization of a door unlatching solenoid at the passenger door. In an alternative embodiment placing the switch in the door unlocking setting when an auxiliary switch is closed effects energization of the door unlatching solenoid.

3,657,554

SUPER-RADIANT SHORT PULSE LASER

Oscar J. Lumpkin, New York, and Norman S. Shiren, Mount Kisco, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,599
Int. Cl. H03f *7/00*
U.S. Cl. 307—88.3 **6 Claims**



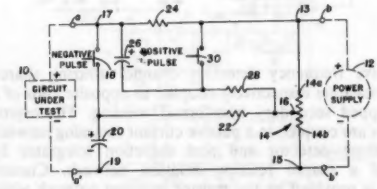
Short intense lasing pulses of resonant radiation, of the order of 10^{-13} sec., are produced by employing adiabatic rapid passage of an optical transition of an optically resonant medium, such as K-vapor. The adiabatic rapid passage is achieved in the K-vapor by frequency modulating each pulse of a ruby laser giant pulse source. The modulated pulses are then passed through a fluoro-nitrobenzene Raman cell to provide an output pulse which has the required power and whose instantaneous carrier frequency sweeps through a resonance having a pair of levels connected by electric dipole transitions in the K-vapor system.

3,657,555

VARIABLE PASSIVE VOLTAGE TRANSIENT GENERATOR

Eric J. Hoffman, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Mar. 27, 1970, Ser. No. 23,161
Int. Cl. H03k *3/53, 3/00*
U.S. Cl. 307—108 **8 Claims**



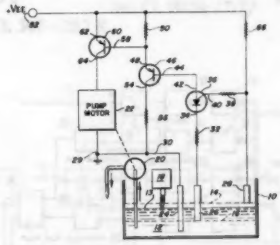
A passive generator that provides for the precise and repeatable generation of voltage transients. A portion of the supply voltage, as determined by a potentiometer, is applied to a first and second capacitor-resistor network. By closing associated first and second switches, the generation of either positive or negative voltage transients, having a variable amplitude and a definite time constant is accomplished.

3,657,556

LIQUID LEVEL SWITCH

Merrill J. Foster, Fox River Grove, Ill., assignor to Marine Industries, Incorporated

Filed Aug. 3, 1970, Ser. No. 60,539
Int. Cl. H01h *45/00*
U.S. Cl. 307—118 **7 Claims**



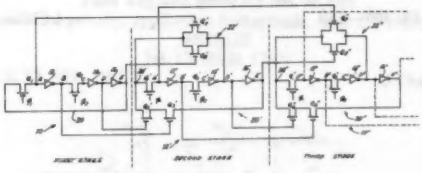
A liquid level switch for maintaining the liquid level in a container between upper and lower limits. A first electrode extends into the container to the upper limit and a second electrode extends into the container to the lower limit. A single active circuit element coupled to the electrodes continually monitors the liquid level and controls a pump to maintain that level between the upper and lower limits. The electrodes are mounted within a cup-shaped housing having an open bottom for receiving the liquid upon bottom first insertion of the cup whereby an air pocket trapped within the cup prevents the liquid from rising into the upper portion of the cup to eliminate false indications caused by the liquid clinging between the electrodes.

3,657,557

SYNCHRONOUS BINARY COUNTER

Kent F. Smith, and Frank M. Wanlass, both of Salt Lake City, Utah, assignors to General Instrument Corporation, Newark, N.Y.

Filed Oct. 19, 1970, Ser. No. 81,902
Int. Cl. H03k *23/22*
U.S. Cl. 307—225 **21 Claims**

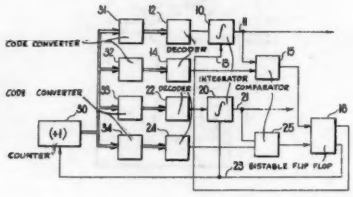


A multistage synchronous binary counter has an improved high speed carry means which is responsive only to the previous stage. Each stage comprises three inverters connected in series, the first and second inverters being isolated periodically by a clocked switching device. Two feedback paths in each stage comprising two switching devices each are adapted to feed back the signals at the outputs of the second and third inverters respectively to the input node, the control terminals of said switching devices being connected to selected nodes in the preceding stage. Another clocked switching device is interposed in both feedback paths whereby each count takes place over a period defined by first and second nonoverlapping clock signals applied to the first and second clocked switching devices, respectively.

3,657,558
MULTIPLE RAMP WAVEFORM GENERATOR

Brian Anthony Patrickson, Maidstone, England, assignor to Elliott Brothers (London) Limited, London, England

Filed Oct. 28, 1970, Ser. No. 86,927
Claims priority, application Great Britain, Oct. 28, 1969, 52,745/69
Int. Cl. H03k 4/08
U.S. Cl. 307—228 5 Claims

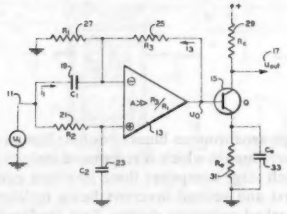


The invention is a circuit for generating a pair of interleaved repeating sequences of several ramp signals of differing slopes and lengths. An integrator 10 is energized by a signal on line 13, and produces an output ramp whose slope is controlled by the signal on line 12. The ramp output is compared with the signal from decoder 14 by comparator 15, and on equality flip-flop 16 changes state. This de-energizes integrator 10 and energizes integrator 20, which operates in a similar way to produce a ramp for the other sequence. Integrators 10 and 20 thus produce ramps alternately, as flip-flop 16 changes between its two states. Each time flip-flop 16 changes into one state, it steps on a cyclic counter 30 which feeds its new count to pre-wired decoders 31 to 34 which determine the parameters (slope and height) of the next two ramps, one from each of the two integrators.

3,657,559
FREQUENCY DEPENDENT ZERO PHASE SHIFT

Nikola Vidovic, Auburn, Calif., assignor to The Singer Company, New York, N.Y.

Filed Apr. 27, 1971, Ser. No. 137,752
Int. Cl. G06g 7/12
U.S. Cl. 307—230 6 Claims

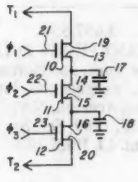


An amplifier providing a frequency dependent gain with no phase shift which is particularly useful in television aperture correction is shown. Generally a frequency dependent input to and feed back around an operational amplifier provide the frequency dependent gain and a transistor circuit with an RC circuit having the same time constant as the feed back circuit, in its emitter path assures zero phase shift.

3,657,560
FREQUENCY-VARIABLE INSULATED GATE FIELD EFFECT RESISTOR

Robert J. Proebsting, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 18, 1970, Ser. No. 20,677
Int. Cl. H03k 5/20
U.S. Cl. 307—233 5 Claims

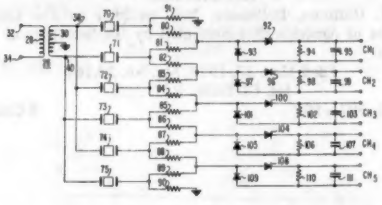


A frequency-variable resistor is comprised of a plurality of source-to-drain series connected, insulated gate field effect transistors. The source-to-drain interconnections are effectively coupled to ground through capacitors and the source contact of the first transistor and drain contact of the last transistor in the series provide the terminals of the resistor. Each of the gate contacts of the plurality of transistors is connected to a signal source of the same frequency, but of a different phase. The resistance of the field effect resistor is then linearly, inversely proportional to the frequency of the signal over a wide range, and extremely high resistances are achieved.

3,657,561
PASSIVE FREQUENCY DETECTION CHANNEL FOR A DATA RETRIEVAL SYSTEM

Henry G. Riekers, Glen Burnie, and Bradley P. Closs, Severna Park, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 21, 1970, Ser. No. 39,278
Int. Cl. H03h 7/02
U.S. Cl. 307—233 12 Claims

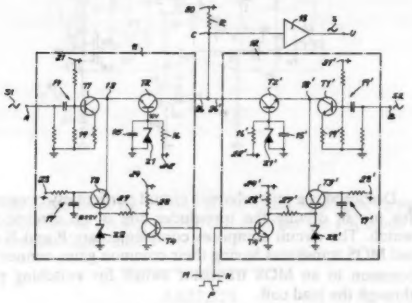


A passive frequency detection channel utilizing shared crystal resonators respectively coupled to opposite ends of a center tapped secondary transformer winding. The crystal resonators are coupled to a passive current summing network and envelope detector and post detection integrator by means of a shared resistor isolation network. Current summing is provided by the resistor isolation network while the envelope detector is comprised of one of a pair of Schottky barrier diodes commonly referred to as hot carrier diodes coupled between the isolation network and a post detection integrator comprising a parallel R-C circuit. Additionally the R-C circuit in combination with both diodes provides a low AC impedance to ground for the crystal resonators and isolation network which is essential for proper operation of the apparatus.

3,657,562
ELECTRONIC SWITCHING ARRANGEMENT

Ezio Cottatellucci, Milan, Italy, assignor to Societa Italiana Telecommunicazioni Siemens S.P.A., Milan, Italy

Filed June 25, 1970, Ser. No. 49,731
Claims priority, application Italy, June 26, 1969, 18711 A/69
Int. Cl. H03k *17/56*
U.S. Cl. 307—243 12 Claims

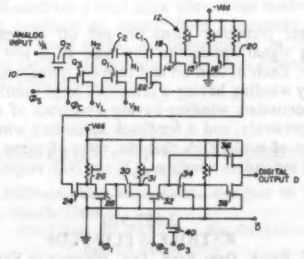


Two or more identical coupling networks, connected between respective signal sources and a common output circuit, are rendered alternately conductive by a control pulse (P) changing the relative magnitude of two biasing voltages applied to the bases of a pair of switching transistors (T2, T3) within each network. The two switching transistors, of like conductivity type (NPN), have their emitters tied to the collector of an input transistor (T1) whose emitter is grounded and whose base receives the message signal to be transmitted; the collectors of the two switching transistors are connected to potential (+) through an output transistor (R) and a dummy load (17), respectively.

3,657,563
AC COUPLED COMPARATOR AND A/D CONVERTER

Billy C. Davis, Round Rock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 30, 1969, Ser. No. 889,144
Int. Cl. H03k *13/10*
U.S. Cl. 307—251 5 Claims

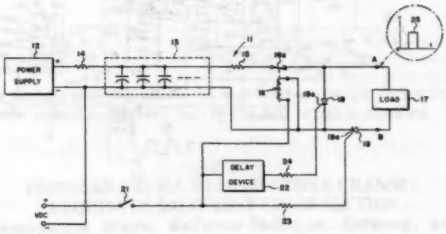


An analog-to-digital converter is disclosed which utilizes an AC coupled all MOS FET comparator, a resistor ladder for producing a reference voltage, and an all MOS FET control circuit and thus has a very low power consumption.

3,657,564
CIRCUIT PROVIDING FAST PULSE RISE AND FALL TIMES

David L. Hollis, Raleigh, N.C., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Continuation-in-part of application Ser. No. 636,099, May 4, 1967, now abandoned. This application Apr. 24, 1970, Ser. No. 31,768
Int. Cl. H03k *17/72*
U.S. Cl. 307—252 K 6 Claims

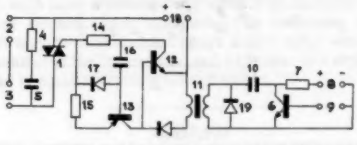


A pulse circuit for generating a pulse of square waveform at substantial current levels utilizing a power source to charge a capacitor bank which is discharged through a load and a first silicon controlled rectifier in series with the load upon the gating on of the first silicon controlled rectifier. A second silicon controlled rectifier is connected to shunt both the load and first silicon controlled rectifier after the correct pulse width is obtained and after being gated on by a delay device whose time characteristics correspond to the desired pulse width.

3,657,565
CONTROL CIRCUIT FOR POWER CONTROL BY MEANS OF A THYRISTOR

Johannes Leyten, Woudenberg, and Nicolaas Mur, Amersfoort, both of Netherlands, assignors to Electrofact N.V., Amersfoort, Netherlands

Filed Aug. 25, 1970, Ser. No. 66,669
Claims priority, application Netherlands, Aug. 27, 1969, 6913129
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 B 3 Claims

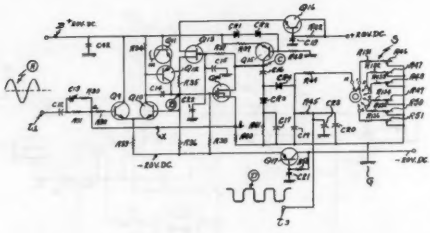


The invention concerns the use of a thyristor in a control circuit for electric power control. The thyristor is so connected and controlled that the number of complete half cycles during which the thyristor is conductive and non-conductive is varied, the thyristor being rendered conductive by a control pulse at its gate electrode immediately before or at the start of the half cycles during which the thyristor is to be conductive.

3,657,566
ALTERNATING CURRENT TO DIRECT CURRENT SIGNAL CONVERTER

Frederick Rodney Holt, Manhattan, N.Y., assignor to The Hickok Electrical Instrument Company, Cleveland, Ohio

Filed May 13, 1970, Ser. No. 36,892
Int. Cl. H03k *5/00*
U.S. Cl. 307—260 **4 Claims**

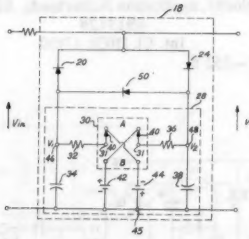


A converter for converting an alternating current signal to a corresponding direct current signal and which has a differential input stage connected to the input of class A amplifier. The amplifier has a shorting circuit connected between its input and a converter circuit therein which converts a voltage signal swing at the amplifier output into a current signal swing and which provides a "zero summing point" or circuit whereby the direct current output signal may be referenced directly to the converter ground, and also wherein the said output is directly related to the input signal current.

3,657,567
SIGNAL GATING CIRCUIT

Richard Brander, Cicero, Ill., assignor to Beltone Electronics Corp.

Filed June 10, 1970, Ser. No. 44,948
Int. Cl. H03k *17/00*
U.S. Cl. 307—259 **13 Claims**

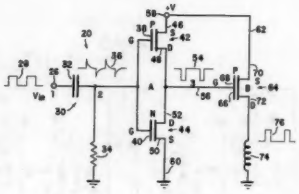


A network for gating a signal to be transmitted across a pair of terminals is connected in parallel across the terminals. The network includes a pair of diodes connected in parallel and oppositely poled which may be biased into conduction when attenuation is desired and into nonconduction when no attenuation is desired. A feedback amplifier is employed to hold the bias voltage for one of the diodes equal and opposite to the bias voltage for the other diode. A resistor-capacitor network allows the bias voltage on the diodes to be varied gradually between the off and on conditions of the gating circuit.

3,657,568
PULSE SHAPING CIRCUIT USING COMPLEMENTARY MOS DEVICES

Bruno Dargent, Lancaster, Pa., assignor to Hamilton Watch Company, Lancaster, Pa.

Filed Jan. 5, 1970, Ser. No. 568
Int. Cl. H03k *5/00*
U.S. Cl. 307—268 **5 Claims**

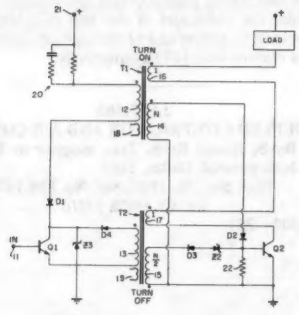


Disclosed is a pulse shaping circuit particularly constructed for use in driving the transducer coil of an electric wristwatch. The circuit comprises complementary P and N channel MOS transistors having their common gates connected in common to an MOS transistor switch for switching power through the load coil.

3,657,569
TURN ON TURN OFF FEEDBACK DRIVE SWITCHING CIRCUIT

Thomas A. Froeschle, Framingham, Mass., assignor to The Bose Corporation, Natick, Mass.

Continuation-in-part of Ser. No. 869,520, Oct. 27, 1969
Filed Feb. 19, 1970, Ser. No. 12,747
Int. Cl. H03k *3/30*
U.S. Cl. 307—275 **15 Claims**



A power transistor turns on and off in response to a switching signal applied to the base of a low level input transistor. Each of turn on and turn off transformers includes a primary winding having a relatively large number of turns, a main secondary winding having a number of turns N and N/2, respectively, and a feedback secondary winding having a number of turns such that the ratio of turns on main to feedback secondary windings is N and N/2, respectively.

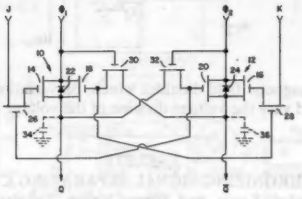
3,657,570
RATIOLESS FLIP-FLOP

Robert E. Brink, Deer Park, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed May 18, 1970, Ser. No. 38,303
Int. Cl. H03k *3/26*
U.S. Cl. 307—279 **9 Claims**

A ratioless J-K mode IGFET flip-flop circuit is produced by providing a pair of NOR gates each having one input con-

nected to a source of flipping signals and the other input cross-coupled through a clocked gate to the output of the other NOR gate. In each NOR gate, the flipping signal input



may be gated from the output of the same NOR gate to permit operation of the flip-flop circuit in either the J-K mode or the common-input mode.

3,657,571

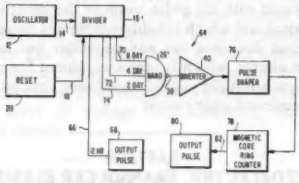
SOLID STATE TIMER

Vincent W. Martin, Lancaster, and Bruce G. Steiner, Richland, both of Pa., assignors to Hamilton Watch Company, Lancaster, Pa.

Filed May 21, 1970, Ser. No. 39,249

Int. Cl. H03k *17/28*

U.S. Cl. 307—293 **8 Claims**



Disclosed is a timer of all solid state components and primarily formed from integrated circuits. The timer comprises a very low frequency oscillator coupled through a divider to an output circuit. In one embodiment, the timer is used to self-destruct a land mine after about twelve hours. In another, it produces an output from a magnetic core ring counter after about a year. Complementary MOSFET's are used for the circuit components to minimize power consumption in both embodiments.

3,657,572

POWER CONVERTER WITH SELF-SYNCHRONIZATION AND BIAS

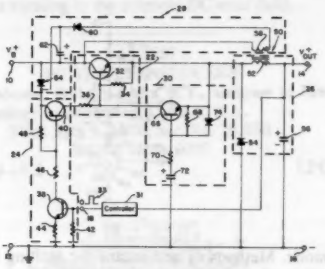
Sidney E. Millman, Van Nuys, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Nov. 20, 1970, Ser. No. 91,335

Int. Cl. H03k *1/14*

U.S. Cl. 307—297 **12 Claims**

A power converter having a self-synchronized commutator that causes the power pass transistor in the converter to very rapidly assume its completely turned off state when converter power output is no longer desired. Also provided is apparatus for the converter which supplies base drive to the power pass transistor in response to a triggering pulse. The base drive apparatus has a feed back transistor bias circuit which includes



a starting gate that allows the converter to operate during the first several cycles until bias by the bias circuit is provided.

3,657,573

UNIPOLAR DEVICE WITH MULTIPLE CHANNEL REGIONS OF DIFFERENT CROSS SECTION

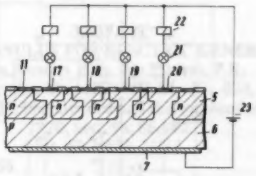
Hans-Jurgen Maute, Heilbronn-Bockingen, Germany, assignor to Telefunken Patentverwertungsgesellschaft m.b.H., Ulm/Danube, Germany

Filed Aug. 28, 1969, Ser. No. 853,765

Claims priority, application Germany, Sept. 2, 1968, P 17 64 911.5

Int. Cl. H01l *19/00*

U.S. Cl. 307—304 **4 Claims**



The invention relates to a unipolar device comprising a semi conductor body having a region of, for example, P or P^+-type conductivity which is traversed by channel-like regions of N-type conductivity having different cross sections. A control voltage applied across the PN-junctions thus formed so as to stress the junctions in the reverse direction will cause pinching off of the channel-like regions in the sequence of their increasing cross sections as the control voltage rises. The invention also includes circuitry by means of which this pinching off can be used to provide indications of the value of the control voltage where the channel-like regions each have a separate electrode. This circuitry includes branch circuits, each comprising an indicating element, which may be incandescent lamps and/or relay windings for the control of for the circuits, and a channel like region, connected in parallel across a voltage source.

3,657,574

TRANSISTOR CIRCUIT OPERATED IN SECOND BREAKDOWN MODE DRIVING A CAPACITIVE IMPEDANCE

Alton O. Christensen, Houston, and Robert E. Brink, Friendswood, both of Tex., assignors to Shell Oil Company, New York, N.Y.

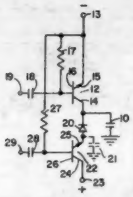
Filed Feb. 3, 1970, Ser. No. 8,207

Int. Cl. H03k *17/60*

U.S. Cl. 307—302 **12 Claims**

A method of and means for driving a capacitive impedance is disclosed in which a transistor is connected between a

source of electrical energy and the capacitive impedance and biased to be triggered into conduction in its second breakdown mode. Methods of and means for limiting the energy passing through such transistor to a level below that required for destruction thereof are described.

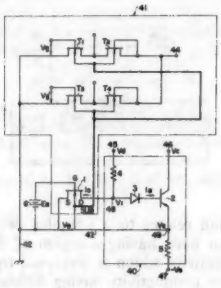


3,657,575

THRESHOLD VOLTAGE COMPENSATING CIRCUITS FOR FETS

Kenji Taniguchi, Kodaira; Ichiro Imaizumi, and Atsuo Hotta, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 15, 1971, Ser. No. 124,183
Claims priority, application Japan, Mar. 13, 1970, 45/20882
Int. Cl. H03k *17/60*
U.S. Cl. 307—304 **7 Claims**



A field effect semiconductor device including a plurality of field effect semiconductor elements formed on a common substrate and a compensating circuit for controlling the threshold voltage of said transistors by comparing the threshold voltage of one transistor to a reference voltage and generating a backward bias control voltage across a PN-junction of the one transistor between the source thereof, which is connected to the source of at least one of the other transistors, and the common substrate.

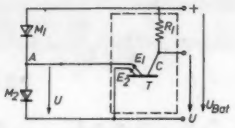
3,657,576

CONTACTLESS SWITCH USING MAGNETIC DIODES

Paul Sieber, Heilbronn-Bockingen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Aug. 25, 1970, Ser. No. 66,781
Claims priority, application Germany, Sept. 3, 1969, P 19 44 690.3
Int. Cl. H03k *17/00*
U.S. Cl. 307—309 **8 Claims**

A contactless switch comprises a controllable active switching element connected through a threshold responsive circuit element to a voltage divide including two series connected magnetic field dioxides which, on variation of a magnetic field vary the voltage division of the voltage divide.

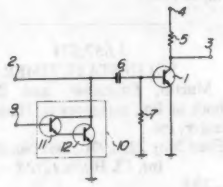


3,657,577

SYNCHRONIZING SIGNAL SEPARATING CIRCUIT

Shuzo Wakai, Kyoto, and Mitsuo Nabae, Takatsuki, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Apr. 23, 1971, Ser. No. 136,788
Int. Cl. H03k *3/26*
U.S. Cl. 307—315 **2 Claims**



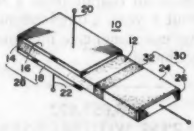
A synchronizing signal separating circuit provided with a noise gating circuit, the gating period of which is sufficiently long compared with the pulse width of the input signal to the input terminal and which reliably suppresses noise. The noise gating circuit does not use any capacitor but consists of a Darlington circuit, which is very convenient for manufacturing the synchronizing signal separating circuit as an integrated semiconductor circuit.

3,657,578

PIEZOELECTRIC TRANSDUCER ELEMENTS

Keiji Inoue, Yokohama, Japan, assignor to Denki Onkyo Company, Limited, Tokyo, Japan

Filed Sept. 17, 1970, Ser. No. 73,132
Claims priority, application Japan, Sept. 24, 1969, 44/90962; 44/90963; 44/90964
Int. Cl. H01v *7/00*
U.S. Cl. 310—8 **5 Claims**



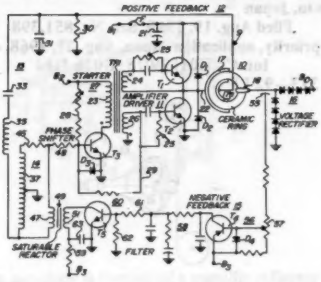
In a piezoelectric transducer element comprising an elongated ceramic plate of a piezoelectric material, a pair of driving electrodes applied on the opposite surfaces of one end of the plate and an output electrode applied to the end surface of the opposite end, an insulator member in the form of a thin coating or flange is applied to surround the plate at a point near the driving electrodes or the output electrode preferably at a node of the mechanical vibration of the element.

3,657,579

POWER SUPPLY CIRCUIT EMPLOYING PIEZOELECTRIC VOLTAGE TRANSFORMING DEVICE

Don A. Kramer, Rolling Meadows, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Apr. 16, 1971, Ser. No. 134,600
Int. Cl. H01v 7/00
U.S. Cl. 310—8.1 12 Claims



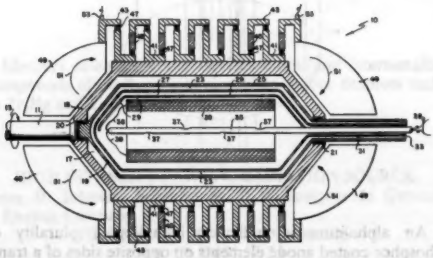
A power supply circuit having a piezoelectric voltage transforming device resonant in a preselected one of a plurality of mechanical vibrational modes for transforming low primary alternating voltages to high secondary alternating voltages whereby the preselected mode is an optimum resonant mode having a range of operating frequencies over which the device resonates with changes in input impedance for the device. The primary alternating voltage is returned at a first operating frequency through a positive feedback circuit loop and an amplifier driver circuit to lock in the particular operating frequency of the device. The positive feedback loop has frequency selective means therein for determining the selection of the optimum resonant mode. Operating frequency can be altered through phase control of the primary feedback voltage within the positive loop, which change of operating frequency alters input impedance and hence the level of voltage transformation through the piezoelectric device.

3,657,580

MAGNETICALLY SHIELDED ELECTRICAL MACHINE WITH SUPER-CONDUCTING FILED WINDINGS

Timothy J. Doyle, Annapolis, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Jan. 18, 1971, Ser. No. 107,211
Int. Cl. H02k 9/197
U.S. Cl. 310—52 7 Claims



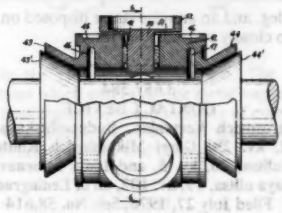
A superconducting coil is mounted within the rotor of a homopolar machine. The section of the rotor surrounding the superconducting coil is enlarged to accomodate the coil and a dewar type container. Magnetic flux from the solenoid extends beyond the exterior of the rotor and links series connected discs rotating in the solenoid DC axial field.

3,657,581

POWER TRANSDUCERS

Leo Hoogenboom, Ballston Lake, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Apr. 9, 1970, Ser. No. 26,950
Int. Cl. H02k 7/00
U.S. Cl. 310—8.2 12 Claims



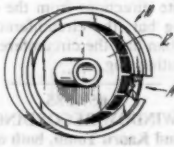
A transducer arrangement is provided which achieves hard and uniform coupling between the transducer element and the transducer body member by mounting the transducer element in shrink-fit relationship with the body member. Conveniently, to assure uniform pressure on the transducer element, the element is shrink-fitted into an opening provided in the body member.

3,657,582

ROTOR ANNULUS FOR ELECTRIC GENERATOR

Russell E. Phelon, Beverly Hills, Rio Piedras, P.R.

Original application May 13, 1969, Ser. No. 824,138, now Patent No. 3,538,394. Divided and this application Oct. 29, 1970, Ser. No. 85,082
Int. Cl. H02k 21/12
U.S. Cl. 310—156 2 Claims



A rotor annulus for an electric generator comprising an annular ring of magnetic members including permanent magnets and pole pieces arranged in respective end-to-end and circumaxial alternate series. A circular spring band surrounds the ring of members in pressing engagement with at least some of the members to hold all of the elements of the annulus in substantially fixed relationship with each other.

3,657,583

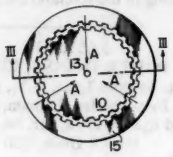
MINIATURE SYNCHRONOUS MOTORS

Naokichi Tamaru, and Shunsaku Nakauchi, both of Tokyo, Japan, assignors to Tohoku Oki Electric Company, Fukushima, Japan

Filed Nov. 12, 1970, Ser. No. 88,892
Claims priority, application Japan, Mar. 18, 1970, 45/22465
Int. Cl. H02k 21/00
U.S. Cl. 310—162 5 Claims

A miniature synchronous motor having a pot shaped core of high permeability magnetic material and having a central

leg and an annular periphery, an energizing coil wound upon the central leg, a circular disc rotor rotatably journalled on



the central leg, and an annular stator disposed on the annular periphery to closely surround the rotor.

3,657,584

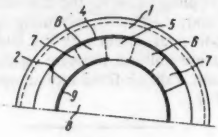
CONTACT DEVICE

Gurgen Petrosovich Vartanian, Budapeshtskaya ulitsa, 15, korpus 2, kv. 29; Garri Mikhailovich Khutoretsky, Altaiskaya ulitsa, 20, kv. 5, and Lidia Semenovna Likhota, Pulkovskaya ulitsa, 19, kv. 102, all of Leningrad, U.S.S.R.

Filed July 27, 1970, Ser. No. 58,614

Int. Cl. H02k *32/08*

U.S. Cl. 310—232 **1 Claim**



A contact device for an electric machine wherein electric current flows through a distributing ring having secured thereto a current conducting bar and a slip ring, there being interposed intermediate of said distributing ring and said slip ring an electrically conductive gasket extending symmetrically in opposite directions from both sides of said current conducting bar. The electric conductivity of said gasket increasing in opposite directions from the central line of said current conducting bar, the circumferential extent of said gasket being less than half the circumference of the adjacent side of said distributing ring.

3,657,585

THIN-WINDOW RECORDING TUBE

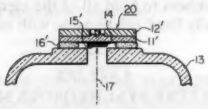
Hiroshi Miyama, and Kaoru Tomii, both of Osaka, Japan, assignors to Matsushita Electric Industrial Company, Limited, Osaka, Japan

Filed Nov. 18, 1970, Ser. No. 90,734

Claims priority, application Japan, Nov. 19, 1969, 44/110428; Nov. 25, 1969, 44/94803

Int. Cl. H01j *29/18, 29/28, 33/00*

U.S. Cl. 313—92 R **2 Claims**



A faceplate of a thin-window recording tube comprising a metal backing electrically isolated from the outside of an evacuated envelope of the recording tube. An embodiment of the faceplate has a metallic support the side surfaces of which are covered with an insulating adhesive. Another embodiment has a metallic support the elongated target of which has formed therein a plurality of circular apertures.

3,657,586

CATHODE RAY TUBE FACEPLATE FORMED OF GRADED INDEX LAMINATED PLATES

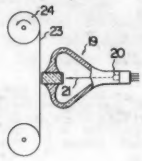
Kazuo Matsushita, Nishinomiya-shi; Ken Koizumi, Itami-shi; Hidetoshi Togo, Itami-shi, and Hajime Kimura, Itami-shi, all of Japan, assignors to Nippon Selfoc Kabushiki Kaisha, Tokyo-to, Japan

Filed Aug. 19, 1969, Ser. No. 851,398

Claims priority, application Japan, Aug. 21, 1968, 43/60096

Int. Cl. H01j *29/18;* **G02b** *5/14*

U.S. Cl. 313—92 LF **2 Claims**



A transparent body of plate form is caused to have refractive index distribution conforming approximately to the equation $n_r = n_0 (1 - ar^2)$, where n_0 is the refractive index in a central plane of the body parallel to its flat surfaces, n_r is the refractive index at a distance r from the central plane, and a is a constant, whereby light or light pattern constituting an image introduced into the body through an edge surface is conducted through the body to the opposite edge surface from which the light or image is directed out.

3,657,587

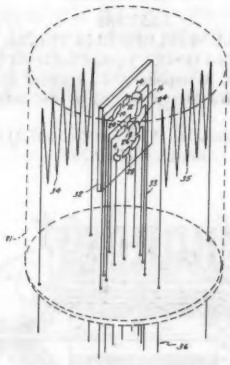
ALPHA-NUMERIC INDICATOR

Thomas D. Kegelman, Ridgefield, Conn., assignor to Computer-Optics, Inc., Newtown, Conn.

Filed Nov. 3, 1969, Ser. No. 873,377

Int. Cl. H01j *17/48*

U.S. Cl. 313—109.5 **5 Claims**



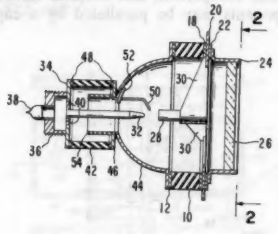
An alpha-numeric indicator including a plurality of phosphor coated anode elements on opposite sides of a transparent substrate, the characters being formed utilizing anode elements from one or both sides of the substrate. Electrons for exciting the phosphors are provided by a thin wire filament structure located on both sides of the substrate.

3,657,588

ENVELOPE STRUCTURE FOR HIGH INTENSITY THREE ELECTRODE ARC LAMPS INCORPORATING HEAT SHIELDING MEANS

Russell C. McRae, Cupertino, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Jan. 19, 1970, Ser. No. 3,655
Int. Cl. H01j 61/30, 61/36
U.S. Cl. 313—113 4 Claims



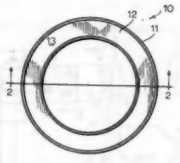
The lamp envelope is formed of a metallic reflector having at each of its ends a cylindrical ceramic insulator and, closing the open ends of the ceramic insulators, metallic cathode and anode support assemblies, the anode support assembly including an optical window sealed across an aperture. Cathode and anode electrodes extend into the envelope from the cathode and anode support assemblies concentrically with the reflector to form an arc gap at the focal point of the reflector. A third electrode connected to the reflector extends into the region of the arc gap for starting purposes. A cylindrical metallic heat shield extends from the cathode end of the reflector into the cylindrical ceramic insulator at that end in order to shield the joint between the cylindrical insulator and the reflector from thermal radiation and convection from the adjacent arc gap.

3,657,589

MERCURY GENERATION

Paolo Della Porta, and Mauro Rebaudo, both of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Oct. 7, 1970, Ser. No. 78,839
Claims priority, application Italy, Oct. 20, 1969, 23582-A/69
Int. Cl. H01j 7/18
U.S. Cl. 313—178 8 Claims



Mercury releasing getter devices employing intermetallic compounds of mercury with zirconium and/or titanium such as Zr_3Hg and Ti_3Hg.

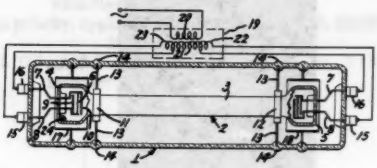
3,657,590

HIGH INTENSITY FAR U.V. RADIATION SOURCE

Peter D. Johnson, Schenectady, N.Y., assignor to General Electric Company

Filed June 26, 1970, Ser. No. 50,105
Int. Cl. H01j 17/20
U.S. Cl. 313—223 10 Claims

A far U.V. emitting vapor electric discharge lamp which emits selectively in the wavelength band of approximately 2,000 to 2,300 A.U. utilizes a light emitting media of a vaporizable ionizable metal such as cadmium or zinc at very low pressure. High current density in excess of 1 ampere per square centimeter is used to excite metal to high intensity emission in an ambient of a noble gas at low pressure. In accord with a preferred embodiment, cadmium or zinc vapors



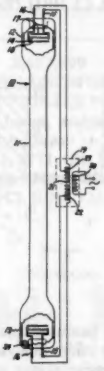
are excited in the presence of xenon gas. The xenon has metastable states which enter into the metal vapor excitation mechanism, resulting in increased intensity of emission at the wavelengths characteristic of the metal species under these conditions of current density and pressure.

3,657,591

HIGH INTENSITY FAR U.V. RADIATION SOURCE

Peter D. Johnson, Schenectady, N.Y., assignor to General Electric Company

Filed June 26, 1970, Ser. No. 50,203
Int. Cl. H01j 17/20
U.S. Cl. 313—223 9 Claims



A far U.V. radiation source emitting high intensity of U.V. at wavelengths principally shorter than 2,000 A.U. includes an electric discharge in a low pressure of mercury vapor at a pressure $2x10^{-3}$ to 0.1 torr and krypton gas at a pressure of approximately 0.5–10 torr. During operation, lamp current is very high, in range of 0.5 to 40 ampere/cm.^{2}, emitting principally at a wavelength of 1,942 A.U.

3,657,592

ELECTRODE JOINT CEMENT

Arnold Arbuthnot Kellar, Columbia Station, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 22, 1970, Ser. No. 30,769
Int. Cl. C09j 5/00
U.S. Cl. 313—357 7 Claims

A high temperature cement, comprising elemental powders of boron and a transition metal and a carbonizable binder, is provided for joining sections of a carbonaceous electric-furnace electrode column. The cement is initially heated to between about 90° C. and 130° C. to thermoset the car-

bonizable binder and then the temperature is elevated to above 1,000° C. to react the transition metal with the boron

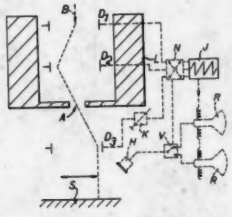
to form a strong cemented bond having excellent thermal and electrical properties.

3,657,593

ELECTRON MICROSCOPY

John Robert Garrood, Emmanuel College, and William Charles Nixon, 2 Causewayside, few Causeway, both of Cambridge, England

Filed Apr. 3, 1969, Ser. No. 813,241
Claims priority, application Great Britain, Apr. 3, 1968, 15,933/68
Int. Cl. H01j *29/80*
U.S. Cl. 315—18 **5 Claims**



In scanning electron beam apparatus such as a scanning electron microscope or micro-analyser the scanning is done in at least three successive stages so that the angle of incidence of the beam on the specimen surface is constant during the scanning cycle. It can be varied at will and by rapid switching between two alternative angles and corresponding switching of the image-forming means, stereoscopic effects are obtainable.

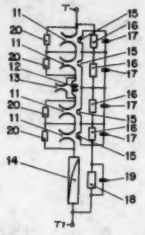
3,657,594

LIGHTNING ARRESTER

Werner Latal, Wettingen, Switzerland, assignor to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland

Filed Aug. 8, 1969, Ser. No. 848,428
Claims priority, application Switzerland, Aug. 28, 1968, 12898/68
Int. Cl. H02h *9/06*
U.S. Cl. 315—36 **4 Claims**

An overvoltage arrester for use on AC or DC voltages comprises a voltage dependent leakage component connected in series with a quenching arc path constituted by a series arrangement of main spark gaps and a magnetic blowing coil for extending the arcs drawn across the main spark gaps. An auxiliary spark gap is structurally associated with and serves when struck to ignite each main spark gap and these ignition are connected in series with a first auxiliary impedance which may be an ohmic resistance to establish an auxiliary series circuit that is connected in parallel with the series circuit formed by the leakage resistance component and the main spark gaps. A second auxiliary impedance component which also may be an ohmic resistance is provided for and connected in parallel with each of the ignition spark gaps. Each of the main spark gaps may be paralleled by an auxiliary impedance component, and each of the auxiliary impedance components may be paralleled by a capacitor.



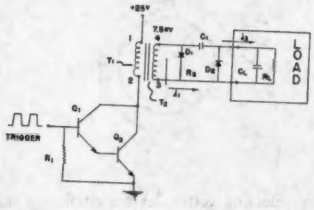
The auxiliary impedance components may be lumped or they may be sub-divided and the partial impedances distributed between and in series with the main and ignition spark gaps, respectively. The string of ignition spark gaps when struck serve to ignite the string of quenching spark gaps whereupon the ignition gaps are then extinguished; the arcs struck at the quenching gaps then expand and cool and are extinguished, and the ignition gaps are then restruck to initiate a new quenching cycle. This cycle is then repeated until the discharge is finally terminated.

3,657,595

SOLID STATE CATHODE RAY TUBE ERASE CIRCUIT

Robert Lee Bressler; Iwan Rangelov Alexiev, both of Harrisburg; Frank Vollmer Troxell, and George Gilman Richards, both of Middletown, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 20, 1968, Ser. No. 761,183
Int. Cl. H01j *29/52*
U.S. Cl. 315—30 **8 Claims**

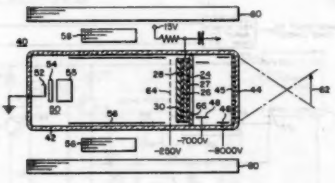


A cathode ray tube high voltage supply erase circuit is disclosed which features a transistor switch triggered to conduct periodically to draw current through the primary of the transformer developing a series of capacitor charging pulses through the transformer secondary. The capacitor charged by the transformer secondary is connected in circuit to provide a high voltage supply permitting an image to be written during discharge of the capacitor with the tube anode being drawn to near zero potential as the transistor switch is triggered to conduct to permit erasure of a previously written image on such tube automatically and repetitively without tube damage.

3,657,596
ELECTRON IMAGE DEVICE HAVING TARGET COMPRISING POROUS REGION ADJACENT CONDUCTIVE LAYER AND OUTER, DENSER REGION

Gerhard W. Goetze, Elmira, and Alvin H. Boerio, Horseheads Township, Elmira, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 20, 1965, Ser. No. 457,430
Int. Cl. H01J 31/58, 31/28, 31/36
U.S. Cl. 313—68 12 Claims

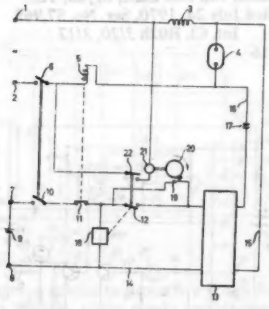


This invention relates to such electron image devices as television camera tubes and image intensifier tubes and includes in one illustrative embodiment an electrically conductive member upon which there is disposed a first layer or region of a secondary emissive material deposited in a porous form to allow conduction of the secondary electrons through the voids of the porous material, and a second layer or region of greater density than the first layer disposed upon the first region to inhibit the escape of the secondary electrons emitted within the volume of the first layer.

3,657,597
ARRANGEMENT FOR IGNITING AND A SUPPLYING GAS AND/OR VAPOUR DISCHARGE LAMP

Jozef Cornelis Moerkens, and Giovanni Porro, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 8, 1970, Ser. No. 26,610
Claims priority, application Netherlands, Apr. 12, 1969, 6905676
Int. Cl. H05b 37/00
U.S. Cl. 315—86 10 Claims



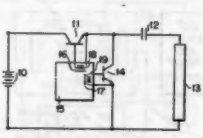
The invention relates to igniting and supplying a gas- and/or vapour discharge lamp.

According to the invention a second voltage source is used in addition to the common voltage source, which second source ensures both the ignition of the lamp and the maintenance of a current flowing through the lamp when the first voltage source has failed due to interference.

3,657,598
APPARATUS FOR OPERATING ELECTRIC DISCHARGE LAMPS

Osamu Nomura, and Fumio Kamiya, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Nov. 5, 1970, Ser. No. 87,181
Claims priority, application Japan, Nov. 11, 1969, 44/89749
Int. Cl. H05b 41/30
U.S. Cl. 315—100 T 7 Claims

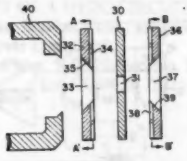


There is disclosed an improved discharge lamp lighting apparatus having a first semiconductor switching element connected in series with the discharge lamp and a second semiconductor switching element connected in parallel with the discharge lamp. A control circuit included in the lighting apparatus for switching on the first and second semiconductor switching elements alternately to light and operate the discharge lamp at a high frequency and prevents short circuit fault of the electric power source due to a simultaneous on-condition of two switching elements by imparting a time interval longer than the turn-off time of the first and second semiconductor switching elements between two pulses respectively driving the first and second switching elements.

3,657,599
INK ACCELERATING UNIT FOR USE IN INK JET PRINTER

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 12, 1971, Ser. No. 123,744
Claims priority, application Japan, Mar. 18, 1970, 45/22287
Int. Cl. G01d 15/18
U.S. Cl. 317—3 4 Claims

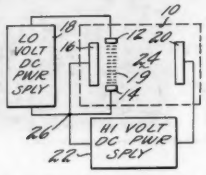


Upon one or both surfaces of an accelerating electrode having a center aperture is overlaid and fixed concentrically a disk member or members each having a center aperture tapered so as to converge toward the accelerating electrode. Unnecessary ink attached to the accelerating electrode may be sucked through the interface or interfaces between the disk member or members and the accelerating electrode under capillary action and ink attached to the disk members may readily flow toward the interfaces along the tapered peripheral surfaces or walls of the center apertures of the disk members. Grooves may be formed in the surfaces of the disk members in contact with the accelerating electrode so as to facilitate the collection and discharge of unnecessary ink sucked into the interfaces under capillary action. Removal of ink attached to the accelerating electrode may be much facilitated, thus assuring the stable operation of the accelerating electrode. In addition, fabrication of the accelerating electrode structure may be much facilitated and simplified yet with a higher degree of accuracy.

3,657,600
AUXILIARY IONIZATION OF DC ELECTRIC DISCHARGE ELECTRODE BOUNDARY SHEATHS

Walter J. Wiegand, Jr., Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.

Filed May 18, 1970, Ser. No. 38,033
Int. Cl. H01j 61/54
U.S. Cl. 317—4 5 Claims

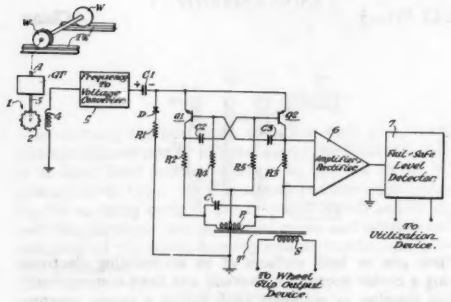


Auxiliary ionization is provided in a DC electric discharge plasma immediately adjacent one or more electrodes, whereby the tendency for streamering or incipient arcing and non uniform attachment of the discharge to electrodes is mitigated. Separate RF electrodes, RF electrodes combined with a DC cathode, separate and combined low voltage DC auxiliary ionization are disclosed. Photon and particle beam ionization are discussed.

3,657,601
VITAL VEHICLE BRAKE ASSURING AND WHEEL SLIP

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Feb. 16, 1971, Ser. No. 115,491
Int. Cl. B61b 13/6
U.S. Cl. 317—5 10 Claims

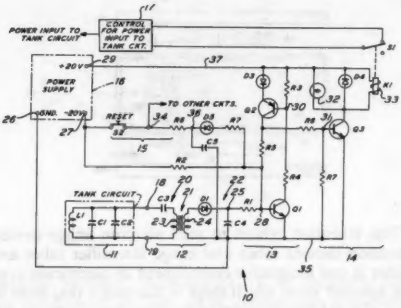


A fail-safe deceleration and wheel slip detection circuit which includes a signal generator for producing signals having a frequency proportional to the speed of a vehicle, a converter for converting the frequency of the signals to a proportional voltage signal, a differentiator for differentiating the voltage signal and for producing a rate of change signal, a multivibrator powered by the rate of change signal for producing output signals proportional thereto, an amplifier-rectifier for amplifying and rectifying the output signals, a level detector for measuring the amplitude of the amplified-rectified signals and energizing a utilization device when and only when the amplitude of the signals exceeds a predetermined minimum level, thereby signifying that the vehicle is decelerating at a sufficient rate, and a wheel slip detector for indicating excessive slippage of a wheel of the vehicle.

3,657,602
METHOD AND MEANS FOR DETECTING INCIPIENT CAPACITOR FAILURE

Paul C. Boehm, and Theodore R. Kennedy, both of Willingboro, N.J., assignors to Inductotherm Corporation, Rancocas, N.J.

Filed Apr. 5, 1971, Ser. No. 131,015
Int. Cl. H02h 7/16
U.S. Cl. 317—12 R 10 Claims

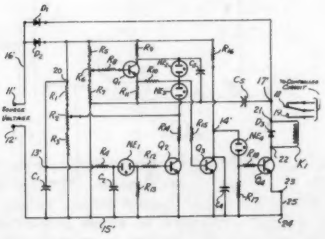


Incipient failure of a capacitor operating as a part of an induction furnace circuit is detected by monitoring the capacitor to determine the presence of high-frequency signals generated by the capacitor as its dielectric material deteriorates. The lower limit of the frequencies of such signals is in the range from 50 to 200 kHz. The sensing apparatus for a 3 kHz induction heating circuit includes detector means for converting the generated signals exceeding about 150 kHz into a control signal whose level exceeds a predetermined value when the generated signals are representative of incipient deterioration of the dielectric. Indicator means responsive to the control signal is operated when the latter signal exceeds said predetermined value, and may disconnect power from the capacitor.

3,657,603
RELAY CONTROL RESPONSIVE TO OVERVOLTAGE AND UNDERVOLTAGE

William M. Adams, 746 Oak Lane, Bryan, Tex.

Filed July 24, 1970, Ser. No. 57,965
Int. Cl. H02h 3/20, 3/12
U.S. Cl. 317—16 7 Claims



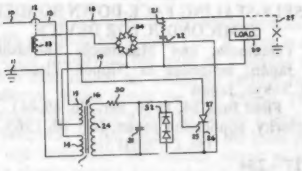
A line voltage guard circuit having a network including neon lamps, resistor-capacitor timing branches, diodes and transistors, the network being connected to a switching relay to control the availability of the supply line voltage to apparatus utilizing same and to disconnect the supply line from the apparatus when the line voltage is either below a bottom

limit for a definite length of time or above a top limit. The circuit automatically reconnects the line to the apparatus a predetermined time after the supply voltage returns to a value between the top and bottom limits.

3,657,604
SHOCK PROTECTION DEVICE CIRCUIT

Henry G. Willard, Wethersfield, Conn., assignor to General Electric Company

Filed Apr. 19, 1971, Ser. No. 135,118
Int. Cl. H02h *3/34*
U.S. Cl. 317—18 D **20 Claims**

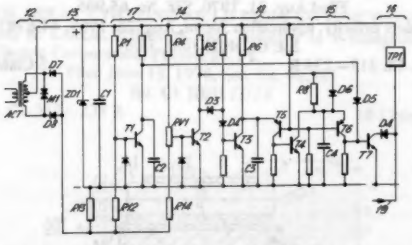


A ground fault protection circuit utilizing a differential transformer whose output is connected by means of a resistance-capacitance transient surge filter to a silicon controlled rectifier which, when turned on energizes a solenoid which trips a circuit breaker controlling a load circuit. The differential transformer, the resistance, and the capacitance are selected to constitute a circuit whose resonance changes with temperature in such a way as to produce an output which varies in amplitude in a manner closely matching and correcting for the inherent temperature-varying sensitivity of the silicon controlled rectifier.

3,657,605
OVERCURRENT TRANSIENT NON-RESPONSIVE TRIP DEVICE

Anthony Hill, Weeping Cross, England, assignor to Associated Electrical Industries Limited, London, England

Filed July 1, 1970, Ser. No. 51,463
Claims priority, application Great Britain, July 2, 1969, 33,362/69; Aug. 8, 1969, 39,847/69
Int. Cl. H02h *3/08*
U.S. Cl. 317—36 TD **7 Claims**

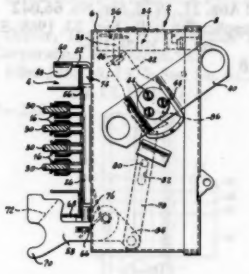


This invention relates to protective relays for systems with transformer loading, either power transformers or transmission lines with transformer feed-offs. In such systems, transformer inrush currents may cause relay tripping on initial energization. To prevent this false tripping, inrush currents may be detected and tripping inhibited. By the invention, inrush currents are detected by squaring the monitored quantity at the trip level, and determining whether the resulting rectangular pulses are separated from each other by more than a present amount. Inrush currents give peaky waveforms, with wide gaps between pulses, while genuine fault currents are roughly sinusiodal, and give wide pulses with only narrow gaps.

3,657,606
BUS DUCT PLUG-IN UNIT WITH IMPROVED INTERLOCK

George Greger, and James J. Rusenko, both of Milwaukee, Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Mar. 25, 1971, Ser. No. 128,002
Int. Cl. H02b *1/08, 11/04*
U.S. Cl. 317—112 **6 Claims**

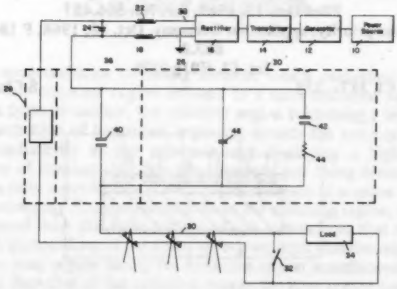


A plug-in unit is hooked into notches in the upper flange of a bus duct, plugged into the duct by swinging it down against the side of the duct wherein stab connectors enter a duct opening to engage the bus bars therein, and latched to the side of the duct by spring biased latches which engage the bottom flange of the duct. An interlock between the unit operator and one of the latches blocks movement of that latch wherein it interferes with the bottom flange to prevent plugging in or removal of the unit with the enclosed switch thereof in the "ON" condition. Indicators are provided on the sides of the bus duct to assist in positioning the unit into the notches when the upper flange is not visible.

3,657,607
IMPEDANCE-INCREASING METHOD AND APPARATUS AS PART OF A HVDC CIRCUIT BREAKER

Wolfgang Knauer, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 9, 1971, Ser. No. 122,396
Int. Cl. H02h *7/22*
U.S. Cl. 317—11 C **10 Claims**



The high voltage DC circuit breaker must generate a variable impedance which increases gradually from negligibly small, when the breaker is closed, to infinitely large, after it has been opened. This invention describes a novel im-

pedance-increasing method comprising serially connected resistance and switch means and a capacitor which shunts both. The switch means, which must be capable of opening and closing a high voltage, is programmed to rapidly switch on and off with increasing offtime so that the time averaged impedance of the DC circuit is increased to an offswitched condition.

3,657,608

FRAME STRUCTURE FOR ELECTRICAL CHASSIS WITH REMOVABLE WIRING CHANNELS

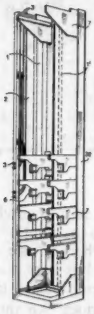
Girolamo Leone, Via Baracca 17, and Giulio Vignola, Via Bassi 17, both of Monza, Italy

Filed Aug. 21, 1970, Ser. No. 66,042

Claims priority, application Italy, Aug. 23, 1969, 53092 A/69

Int. Cl. H02b *1/04*

U.S. Cl. 317—118 **10 Claims**



A bearing structure for telecommunication equipments, consisting of a frame for bearing the wirings and the drawers containing the functional units, comprising the first housing for the power and the servicing wirings and a second housing for the coaxial cables. These housings are provided with connectors which are removably coupled to counterpieces provided in the frame, and the drawers have fixed thereto means operated by a screw for coupling the connectors of the first housing with their conjugate counterpieces.

3,657,609

ELECTRICAL DEVICE CONTROLLED BY AT LEAST TWO TUNABLE CAPACITANCE DIODES

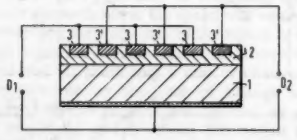
Gernot Oswald; Wolfgang Wenzig, both of Munich, and Hugo Ruchardt, Gauting, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany

Filed Oct. 15, 1969, Ser. No. 866,487

Claims priority, application Germany, Oct. 18, 1968, P 18 03 883.0

Int. Cl. H01g *9/06*

U.S. Cl. 317—234 **8 Claims**



Electrical device controlled by at least two tunable capacitance diodes and means impressing a tunable voltage upon said diodes. The device is so characterized that the capacitance diodes which are combined, in a known manner, within a single semiconductor crystal, have as their common component, a surface region produced at one flat side of the semiconductor crystal, whose boundary to the semiconductor crystal is at least essentially parallel to the flat semiconductor surface. The other component of the capacitance diodes, simultaneously produced regions are embedded therein. The embedded regions of opposite conductance type are so arranged over the entire area of the surface region and provided for the individual tuning diodes. Each square amounting to a maximum of 20 percent of the total area of the surface region, contains at least a portion of the active PN-junctions of each of the provided tuning diodes.

3,657,610

SELF-SEALING FACE-DOWN BONDED SEMICONDUCTOR DEVICE

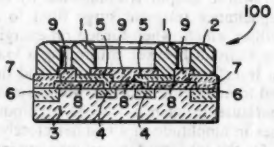
Hirohiko Yamamoto, and Masamichi Shiraishi, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed June 24, 1970, Ser. No. 49,441

Claims priority, application Japan, July 10, 1969, 44/54891

Int. Cl. H01l *5/02*

U.S. Cl. 317—234 **11 Claims**



In a self-sealing semiconductor device of the face-down bonding type, a plurality of electrode bumps are formed on one surface of semiconductor substrate and surrounded by a sealing projection of substantially uniform height.

3,657,611

A SEMICONDUCTOR DEVICE HAVING A BODY OF SEMICONDUCTOR MATERIAL JOINED TO A SUPPORT PLATE BY A LAYER OF MALLEABLE METAL

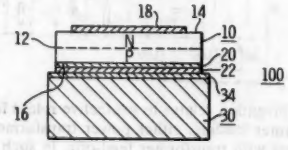
Yoshitada Yoneda, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 21, 1970, Ser. No. 65,986

Claims priority, application Japan, Aug. 25, 1969, 44/67074

Int. Cl. H01l *3/00, 5/00*

U.S. Cl. 317—234 R **5 Claims**

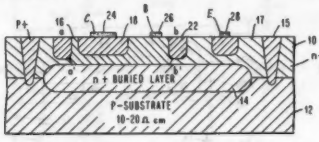


This disclosure relates to a semiconductor device comprising a wafer of semiconductor material with ohmic contacts affixed to opposed parallel major surfaces of the wafer. The device is bonded to a metal support block along at least one of the major surfaces of the wafer.

3,657,612
INVERSE TRANSISTOR WITH HIGH CURRENT GAIN

Siegfried K. Wiedmann, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1970, Ser. No. 29,814
Int. Cl. H01l 5/00, 11/06, 19/00
U.S. Cl. 317—235 5 Claims

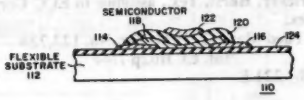


This specification discloses an inversely operated planar transistor with a high current gain. That is, what is described is a scheme for improving the gain of a planar transistor formed with a base region set within an emitter region and having a collector region within the base region. The higher gain is obtained by placing a heavily doped lateral junction around the periphery of the base so that the main portion of the carrier injections into the emitter occur in a vertical direction to a closely spaced, highly doped, highly conductive buried layer.

3,657,613
THIN FILM ELECTRONIC COMPONENTS ON FLEXIBLE METAL SUBSTRATES

Thomas P. Brody; Derrick J. Page, both of Pittsburgh, and Paul O. Raygor, Irwin, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 747,064, June 24, 1968. This application May 4, 1970, Ser. No. 34,463
Int. Cl. H01l 11/14
U.S. Cl. 317—235 R 7 Claims

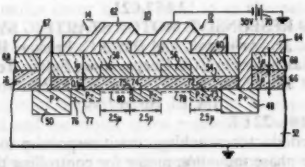


This disclosure is concerned with thin film field effect transistor (FET) formed on flexible metal substrates by vapor deposition techniques. The FET is electrically insulated from the metal substrate by an electrically insulating varnish.

3,657,614
MIS ARRAY UTILIZING FIELD INDUCED JUNCTIONS

James R. Cricchi, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 15, 1970, Ser. No. 46,381
Int. Cl. H01l 11/14
U.S. Cl. 317—235 R 10 Claims

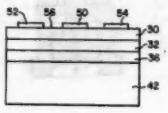


A high density MIS array on a single substrate wherein at least two series coupled transistors are provided comprising two diffused junctions separated laterally in one surface of the substrate with a pair of spaced apart gate electrodes located intermediate thereof and separated therefrom by a first layer of insulated material. Another or top electrode separated from the pair of gate electrodes by a second layer of insulated material extends above and across to at least the closest edge of the two diffused junctions. A bias potential is applied between the substrate and the top electrode whereby field induced regions and respective P-N junctions are generated in the surface of the substrate between the diffused junctions in the region not subtended by the two gate electrodes. Two MIS transistors result having a common field induced junction therebetween, said common field induced junction acting as the drain for one transistor and the source for the other transistor.

3,657,615
LOW THERMAL IMPEDANCE FIELD EFFECT TRANSISTOR

Michael C. Driver, Trafford, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 30, 1970, Ser. No. 51,147
Int. Cl. H01l 11/14
U.S. Cl. 317—235 R 5 Claims



This disclosure is directed to a Schottky Barrier field effect transistor (FET) having a low thermal impedance and to a process of producing it.

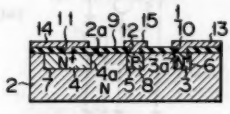
The thermal impedance of the device is reduced by reducing the thickness of a semiinsulating layer of semiconductor material through which the device is joined to a heat sink.

The process for making the device disclosed makes possible the reducing of the layer.

3,657,616
SEMICONDUCTOR SWITCHING ELEMENT

Yoshihiko Mizushima, and Tsuneta Sudo, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

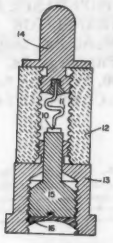
Filed Dec. 15, 1969, Ser. No. 885,388
Claims priority, application Japan, Dec. 20, 1968, 43/93347
Int. Cl. H01l 11/08
U.S. Cl. 317—235 R 10 Claims



A semiconductor switching element which comprises at least one collector region diffused in a semiconductor substrate from its surface, the collector region containing a high concentration of impurities imparting thereto the same type of conductivity as the substrate and displaying a higher degree of conductivity than the substrate and being formed into a fully narrow area, a base region diffused at a space of approximately 50 microns max. from the collector region, as measured from the same surface of the substrate as that on which there is formed the collector region, such that the edge of the base region facing the collector region is sufficiently longer than that of the collector region, the base region containing a high concentration of impurities imparting thereto the same type of conductivity as the semiconductor substrate and displaying a higher degree of conductivity than the substrate, and at least one emitter region diffused from the same

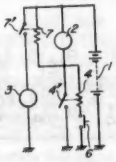
surface of the substrate as that through which the aforesaid two regions are diffused and having an opposite type of conductivity as the substrate.

3,657,617
POINT CONTACT SEMICONDUCTOR DEVICE
Cyril Morgan, Marblehead, Mass., assignor to Alpha Industries, Inc., Newton, Mass.
Filed July 9, 1970, Ser. No. 53,533
Int. Cl. H01l *5/04*
U.S. Cl. 317—236 **7 Claims**



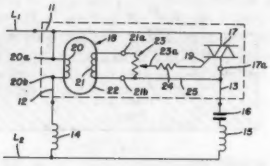
Point contact semiconductor diode including a catwhisker of tungsten or molybdenum having its pointed tip coated with a thin layer of chromium, nickel-chromium, cobalt, platinum, or an alloy of chromium and platinum.

3,657,618
WINDSHIELD WASHER AND WIPER
Takaaki Ori, Nagoya, and Keitaro Kanada, Toyohashi-shi, both of Japan, assignors to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan
Filed July 31, 1969, Ser. No. 846,386
Claims priority, application Japan, Aug. 6, 1968, 43/67388; 43/67389; Sept. 28, 1968, 43/84425; Mar. 7, 1969, 44/20902; Mar. 10, 1969, 44/18219
Int. Cl. H02p *1/58*; B60s *1/02*
U.S. Cl. 318—102 **6 Claims**



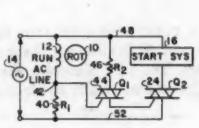
A windshield washer and wiper system inducing a washer motor circuit and a wiper motor circuit both connected in parallel with a source of power. The system comprises a washer and wiper interlocking control circuit having a heating wire connected in parallel with a washer motor and a thermal switch provided with the wiper motor and adapted to be opened and closed by said heating wire. A switch means is also connected in series with the parallel circuit of said heating wire and said washer motor for controlling the starting and stopping of said washer and wiper interlocking device, and may incorporate a thermal switch utilizing a transition between a stress-deformed state and a self-returned state of a snap strip provided with a tension wire which expands or contracts with the application of heat.

3,657,619
STARTING CONTROLLER FOR ELECTRIC MOTOR
Winston A. Love, 118 Maple Street, Marietta, Ohio
Filed July 22, 1970, Ser. No. 57,286
Int. Cl. H02p *1/44*
U.S. Cl. 318—221 R **10 Claims**



A starting controller is provided for electric motors of the split-phase type. This controller incorporates an electrical switching circuit utilizing a bi-directional, solid-state switching device as the element which effects the switch function. The circuit elements and components are incorporated in a mechanical structure having an electrical current transformer provided with a core that also forms a heat sink for the solid-state switching device. The core thus mechanically supports both the switching device and the transformer windings, performing a heat dissipation function as well as forming a part of the magnetic circuit for the transformer controlling operation of the solid-state switching device. All components including the transformer core, are embedded in a dielectric potting compound within an outer iron core shell forming the remainder of the magnetic circuit for the transformer.

3,657,620
SOLID STATE MOTOR START SWITCH
David C. Fricker, Hurst, Tex., assignor to ECC Corporation, Euless, Tex.
Filed Mar. 12, 1971, Ser. No. 123,734
Int. Cl. H02p *1/44*
U.S. Cl. 318—221 E **9 Claims**

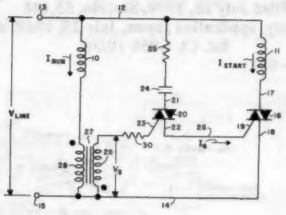


An electronic switch circuit for controlling the start operation of a single phase induction motor in accordance with the speed of the motor.

3,657,621
SPEED RESPONSIVE MOTOR STARTING SYSTEM
Leon Fink, Jr., Arlington, and David C. Fricker, Hurst, both of Tex., assignors to ECC Corporation, Euless, Tex.
Filed Mar. 12, 1971, Ser. No. 123,735
Int. Cl. H02p *1/44*
U.S. Cl. 318—221 E **10 Claims**

A semiconductor switching circuit responsive to the speed of a single phase induction motor for controlling the starting operation thereof. A power bilateral semiconductor switching device is connected in series with the motor starting reactance for controlling current flow therethrough. A logic bilateral semiconductor switching device is coupled to the gate electrode of the power device for enabling and disabling the operation thereof. A current sensing transformer is coupled in circuit with the motor run winding for controlling

the logic switching device in accordance with the motor speed. A capacitor is connected in series in the gate elec-



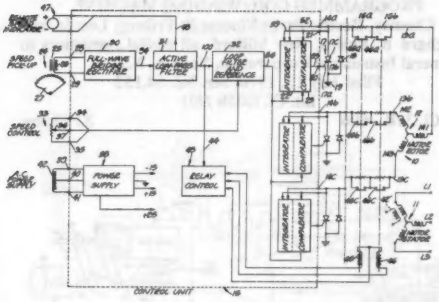
trode circuit for the power switching device for advancing the phase angle of the gating current supplied thereto.

3,657,622

CONTROL FOR ADJUSTING AND REGULATING THE SPEED OF AN ELECTRIC MOTOR

Frank E. Reuland, Newport Beach, and Richard R. Palm, Brea, both of Calif., assignors to Reuland Electric Company, Industry, Calif.

Filed Apr. 30, 1970, Ser. No. 33,184
Int. Cl. H02p 7/62
U.S. Cl. 318—237 **5 Claims**



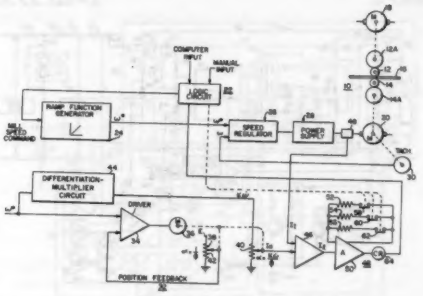
Control means for adjusting and regulating the speed of an alternating current electric motor of the wound rotor type, wherein the motor stator is connected to an alternating current power line, and the circuit leads of the rotor winding are connected through gate controlled solid-state switching elements which are operable to rapidly close and open the rotor winding circuit so as to produce pulsed power, and by varying the duration of the produced pulses the average torque will be varied and the motor speed regulated. The gate controlled switching elements are automatically controlled in response to changes in a sensed signal resulting from a comparison of a speed sensitive transducer output voltage with a reference voltage which can be adjustably set according to the desired motor speed. Changes in the reference voltage thus provide for adjustment of the motor speed, while the variations of the transducer voltage in relation to the adjusted reference voltage provide for speed regulation at the selected motor speed.

3,657,623

SYSTEM FOR TRACKING MILL STAND MOTOR CURRENTS FOR OPTIMIZING THE DUTY CYCLE

Jan M. Fludzinski, Williamsville, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 17, 1970, Ser. No. 64,450
Int. Cl. H02p 5/00
U.S. Cl. 318—326 **5 Claims**



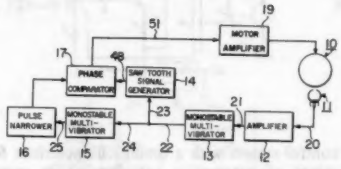
This disclosure relates to a system for automatically monitoring mill drive motor accelerating and load currents in the full field and weakened field range, for speed regulated drives with automatic cutoff of acceleration on reaching operator preset load conditions. The system enables obtaining maximum acceleration rates and maximum speeds compatible with motor overload ratings, so as to optimize the known duty cycle to make full utilization of the mill stand motor consistent with design specifications.

3,657,624

SPEED CONTROL MECHANISM FOR A D.C. ELECTRIC MOTOR

Masahiko Nagano, Tokyo, Japan, assignor to Akai Electric Co., Ltd., Tokyo, Japan

Filed Sept. 21, 1970, Ser. No. 73,816
Claims priority, application Japan, Sept. 19, 1969, 44/74428
Int. Cl. H02p 5/16
U.S. Cl. 318—341 **5 Claims**



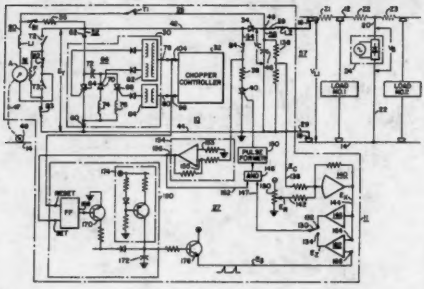
The speed controller includes a first pulse generator which operates in response to a motor revolution pickup head to produce a sawtooth pulse with the pulse interval being proportional to the speed of the motor and a second pulse generator for producing a series of pulses having a constant time lag relative to a certain preceding one of said sawtooth pulses. The combined pulses produce a control signal pulse series for control of the motor current.

3,657,625

SYSTEM FOR BLENDING DYNAMIC AND REGENERATIVE BRAKING

Lanan G. Miller, and Terry D. Sanders, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1969, Ser. No. 879,500
Int. Cl. H02p 3/06
U.S. Cl. 318—370 8 Claims



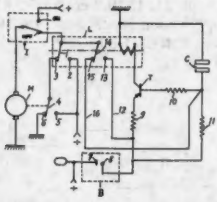
A method and a system wherein the electric power generated by a motor in the braking mode is distributed between a dynamic brake resistor and the motor supply lines in a ratio that varies as a function of the degree of power receptivity of the motor supply lines. Power receptivity is the capability of the supply lines to accept the power generated by the motor in the braking mode at a given time.

3,657,626

TIMED CONTROL SYSTEMS OF WINDSCREEN WIPERS

Philippe Rouvre, and Francois Peroy, both of Billancourt, France, assignors to Regie Nationale des Usines Renaut, Billancourt and Automobiles Peugeot, Paris, France

Filed Sept. 14, 1970, Ser. No. 71,681
Claims priority, application France, Sept. 17, 1969, 6931586
Int. Cl. B60s 1/02
U.S. Cl. 318—443 5 Claims



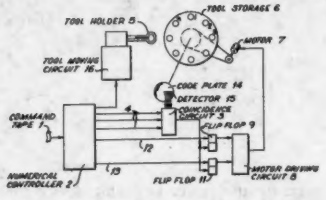
This control system with a timing characteristic for windscreen wiper of automotive vehicles, which comprises a wiper driving motor and an ON-OFF switch, further includes a control circuit connected to the stop contact of said switch, said control circuit comprising a relay with contact means for energizing the wiper motor, a transistor and a push-button switch, disposed in series, the base circuit of said transistor comprising a capacitor the charging time of which determines the conductive time of said transistor and therefore the energization of the wiper motor as a consequence of the actuation of said push-button switch, said relay comprising a contact adapted to hold the transistor and relay assembly in its energized condition when said relay is energized, and also to discharge said capacitor when said relay resumes its inoperative condition.

3,657,627

TOOL SELECTION SYSTEM

Seiuemon Inaba, and Kengo Kobayashi, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed July 15, 1970, Ser. No. 55,148
Claims priority, application Japan, July 23, 1969, 44/58147
Int. Cl. G05b 19/26
U.S. Cl. 318—601 4 Claims



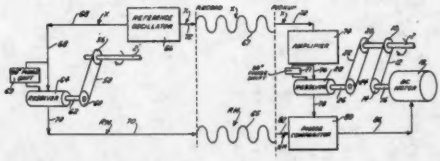
Recorded instructions in a memory include a plurality of tool codes corresponding to tools to be selected and a plurality of corresponding tool addresses. A plurality of tools are stored in a movable tool storage. When a tool code is commanded in a tape, the storage address corresponding to such tool code is read out from the memory and moves the tool storage to a position at which the desired tool may be removed therefrom. The tool storage is halted when the tool address of the desired tool corresponds to the tool address read out from the memory.

3,657,628

PROGRAMMED COIL WINDING MACHINE

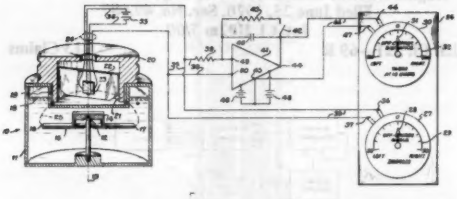
John Chesney, Roselle Park; Vincent P. Friberg, Leonia, and Richard B. Phelps, New Milford, all of N.J., assignors to General Instrument Corporation, Newark, N.J.

Filed July 13, 1970, Ser. No. 54,152
Int. Cl. G05b 1/01
U.S. Cl. 318—606 33 Claims



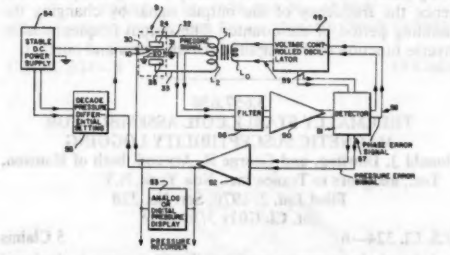
A coil winding machine in which the rotational position of the form on which the coil is to be wound and the translational position of the guide which leads the wire onto the form are both controlled by electrical signals of a type which may readily be recorded onto a tape or other record medium, preferably in the form of phase modulated and/or frequency modulated signals. The signals may be artificially created or created from a master winding machine the operations of which are to be duplicated by the machines controlled by the recorded signals. Thus a single standard record-controlled winding machine can be used without adaptation to form any desired number of coils of any desired characteristic within the capabilities of the machine. Separate control signals are produced for rotational positioning of the coil form and translational positioning of the wire guide, and those signals, together with a reference signal, are impressed onto the record and are then reproduced so as to control the operation of the machine.

3,657,629
NAVIGATIONAL INSTRUMENT
Edward C. Lloyd, 8624 Red Coat Lane, Potomac, Md.
Filed Feb. 26, 1970, Ser. No. 14,367
Int. Cl. G05f 1/00
U.S. Cl. 318—647 3 Claims



A Hall-effect transducer mounted on the axis of rotation of the magnet of a shipboard or aircraft magnetic compass produces a time-varying electrical signal having magnitude proportional to the sine of the angle between a preselected heading of the craft and the actual heading at any moment. The signal, and its time-integral which is proportional to the off-course distance of the craft at constant speed, are displayed on indicating meters for the use of the pilot in steering or are applied to control an automatic steering system.

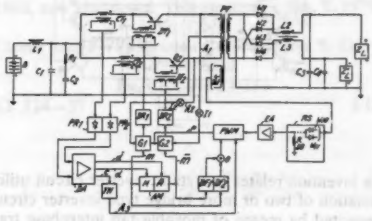
3,657,630
ELECTRO SERVOSYSTEM FOR A FORCE BALANCING GAUGE
Owen O. Fiet, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Oct. 9, 1968, Ser. No. 766,261
Int. Cl. G05b 11/01
U.S. Cl. 318—676 2 Claims



A very sensitive servosystem is provided for use with measuring instruments or gauges of the type wherein the force to be measured is counterbalanced by an identical force which tends to maintain the force sensing element in a null position. The restoring force may be current sensitive. Deviations from the null position are represented as an output of an alternating current bridge circuit. The bridge output is utilized in feedback circuit to control a current supplied to the gauge restoring force device. High resolution is accomplished by means of an amplified bridge output, a narrow band filter, and a phase-lock loop circuit. When used in association with a pressure gauge of the type described, the force and counter force are per unit area of sensing element.

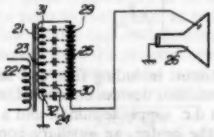
The pressure gauge disclosed herein is disclosed and claimed in copending application Ser. Number 766,261, filed concurrently herewith and assigned to the assignee of the present application.

3,657,631
CONVERTER CIRCUITS
Jean Victor Martens, Deurne-Antwerp; Marcel Clement Rene Natens, and Amanuel De Aguirre, both of Antwerp, all of Belgium, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Nov. 25, 1970, Ser. No. 92,718
Claims priority, application Netherlands, Dec. 19, 1969, 6919147
Int. Cl. H02m 3/32
U.S. Cl. 321—2 2 Claims



This invention relates to a chopper circuit for converting the voltage from an input DC source into an alternative output voltage. The ends of the primary winding of the output transformer are coupled to one pole of said DC source via first and second switching devices. The other pole of the DC source is coupled to a mid-tapping of the primary winding. A control signal generator provides first and second phase pulse sequences which are fed to said first and second devices to alternately switch them ON and OFF. To eliminate DC magnetizing current the pulse widths of the first and second pulse sequence so that the current pulse widths at the output of the power transistors are maintained substantially equal.

3,657,632
RECTIFYING DEVICE
Keisuke Miyoshi, Takatsuki, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Oct. 22, 1970, Ser. No. 83,143
Claims priority, application Japan, Oct. 29, 1969, 44/87045; 44/87046; 44/87047; 44/87048; 44/87049; Dec. 9, 1969, 44/99654; 44/117749; 44/117750; 44/117751
Int. Cl. H02m 7/00
U.S. Cl. 321—8 R 8 Claims

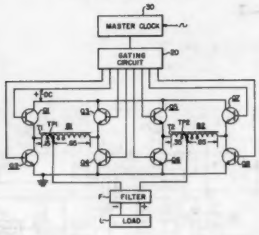


A rectifying device in which the high-voltage side coils of the secondary winding of an a-c voltage-generating transformer are placed opposite the a-c side rectifier elements of a stacked-type semiconductor rectifier and the low-voltage side coils thereof opposite the d-c side rectifier elements of said rectifier, thereby rendering almost uniform the reverse voltages across each of the rectifier elements by means of the distributed capacitance between the winding and the electrodes of the rectifier elements.

3,657,633
MULTIPLE BRIDGE DIFFERENTIAL VOLTAGE STATIC INVERTER

Joseph M. Urish, Lima, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 27, 1970, Ser. No. 93,143
Int. Cl. H02m *1/12*
U.S. Cl. 321—9 A **11 Claims**

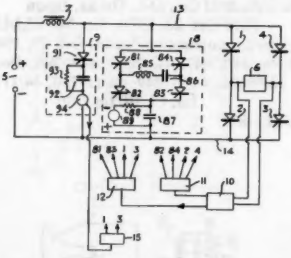


This invention relates to a static inverter circuit utilizing a combination of two or more bridge type inverter circuits interconnected by means of movable tap interphase transformers for developing a stepwise inverter output waveform with little harmonic distortion. Through selective positioning of the taps and proper sequential actuation of the power switch elements comprising the bridge circuits, a stepwise sinewave inverter output waveform can be generated.

3,657,634
INVERTER CIRCUIT

Robert Henry Eastop, London, England, assignor to Westinghouse Brake and Signal Company Limited, London, England

Filed Nov. 3, 1970, Ser. No. 86,538
Claims priority, application Great Britain, Nov. 26, 1969, 57,921/69; July 17, 1970, 34,880/70
Int. Cl. H02m *7/52*
U.S. Cl. 321—45 S **15 Claims**

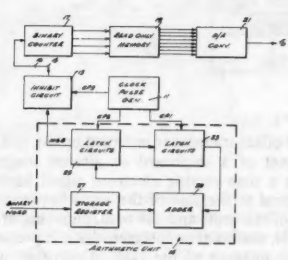


In an inverter circuit including first and second pairs of main controllable rectifier devices connected in a bridge configuration between d.c. supply terminals and a resonant load connected across the bridge, an auxiliary commutation circuit is provided for diverting current, over a number of cycles following starting of the inverter, from the controllable rectifier devices at the instant a controllable rectifier device is to be commutated into the non-conducting condition thereof so as to assist in said commutation. An additional circuit is provided for "shocking" the load circuit into resonance during start-up. The load circuit provides natural commutation of the pairs of controllable rectifier devices during normal operation and, during starting, triggering pulses are applied to the incoming controllable rectifier devices sufficiently before the voltage zero of the natural resonant load circuit frequency to ensure adequate build-up of current in these incoming devices.

3,657,635
DIGITAL PHASE SHIFT FREQUENCY SYNTHESIZER

Richard D. Quinn, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 25, 1970, Ser. No. 49,687
Int. Cl. H02m *5/00*
U.S. Cl. 321—69 R **13 Claims**



A digital phase shifter for synthesizing an output frequency where, in one embodiment, a counter is responsive to first clock pulses received from a clock generator via an inhibit circuit to produce a plurality of output signals which selectively switch a plurality of resistors in or out of the input circuit of an amplifier to digitally produce an output frequency. Any output frequency within a desired band may be generated upon the application of a corresponding binary command number to an arithmetic unit, which continually adds the command number to itself at each occurrence of second clock pulses. Each time that the count of the arithmetic unit overflows an inhibit signal is applied to the inhibit circuit to prevent the following first clock pulse from being passed to the counter, thereby shifting the phase and hence the frequency of the output signal by changing the counting period of the counter. The output frequency is an inverse function of the amplitude of the command number.

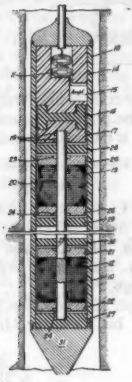
3,657,636
THERMALLY STABLE COIL ASSEMBLY FOR MAGNETIC SUSCEPTIBILITY LOGGING

Donald J. Dowling, and George R. Atwood, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Jan. 2, 1970, Ser. No. 328
Int. Cl. G01v *3/10, 3/18*
U.S. Cl. 324—6 **5 Claims**

A borehole magnetic susceptibility apparatus is disclosed which includes a transmitter search coil, a receiver search coil, both wound over a low thermal co-efficient core element such as glass, an AC power supply coupled with the transmitter search coil for generating an alternating magnetic field which after passing at least in part through the earth formation couples magnetically with the receiver search coil for inducing therein a voltage signal dependent in part on the magnetic susceptibility of the formation and which is in quadrature phase relationship with the transmitter coil current. The apparatus includes a nulling coil having a primary winding connected in series with the transmitter coil and a secondary winding connected in series opposition with the receiver coil to render detectable the small variations of the quadrature phase signal representing the magnetic susceptibility. A thermally stable and shock resistent sub-assembly of the transmitter and receiver search coils is provided for improved environmental stability of the tool. The method of subjecting the earth formation to an alternating magnetic

field to induce therein a field which depends on the magnetic susceptibility of the formation, detecting the induced magnetic field by permitting it to act on a receiver element to induce therein a first signal which depends on the magnetic susceptibility of the formation, generating a reference second



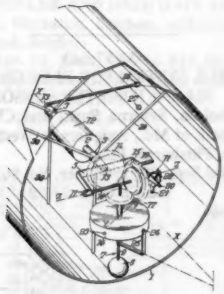
signal representing the susceptibility of a reference medium, and generating a third signal corresponding the difference between the first and second signal whereby the third signal represents the magnetic susceptibility of the formation with respect to the magnetic susceptibility of the reference medium.

3,657,637

APPARATUS FOR MEASURING THE ATTITUDE OF A BOREHOLE

Rene Claret, Sceaux, France, assignor to Societe D'Applications Generales D'Electricite Et De Mecanique Sagem, Paris, France

Filed June 15, 1970, Ser. No. 45,966
Claims priority, application France, June 19, 1969, 6920513
Int. Cl. G01v *3/00;* **E21b** *47/022*
U.S. Cl. 324—8 **10 Claims**



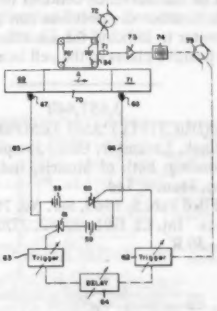
The measuring apparatus includes a hollow shaft coaxial with the drilling line, a pendulum device, a driving motor, driving through a central spindle and gears, a rotary device, sensitive to the earth magnetic field and mounted pivotably around a vertical rod of the pendulum device. Rotary and fixed detecting members produce signals indicating the inclination with respect to the vertical and the azimuth with respect to magnetic north of the drilling line. One detector means may comprise a ball or roller of electrically conducting material, moving over two rails in the form of a loop. One rail is of electrically conducting material and the other is partly of electrically conducting material and partly of insulating material. The two rails are at different potentials.

3,657,638

METHOD OF MAGNETIC FLAW DETECTION IN BODIES OF NON-CIRCULAR CROSS SECTION USING UNIDIRECTIONAL MAGNETIZATION AND DEMAGNETIZATION PULSES TO ELIMINATE EDGE DISTORTION OF THE MAGNETIC FIELD

Paul Holler, Oberhausen, and Paul Scholten, Essen-Frintrop, both of Germany, assignors to Huttenwerk Oberhausen AG, Oberhausen, Germany

Continuation-in-part of application Ser. No. 775,665, Nov. 14, 1968, now abandoned. This application Jan. 7, 1970, Ser. No. 1,275
Claims priority, application Germany, Jan. 9, 1969, P 19 00 992.8
Int. Cl. G01r *33/12*
U.S. Cl. 324—37 **5 Claims**



Method of detecting the location and extent of superficial faults, especially cracks, and for measuring the depths of such cracks in bars, billets, blooms, ingots, rods and tubes, especially of noncircular cross section. An electric current is passed axially through the elongated metallic body in one direction, and the magnetic flux of field (crossflux) generated by the passage of the electric current through the body is detected along the surface thereof. To avoid or reduce the effects of the edges of the noncircular body upon the detected magnetic field strength or flux and, therefore, to reduce the possibility that longitudinal cracks in the region of these edges will be undetected or poorly evaluated, the electric current passed axially through the bar is pulsed with the pulse shape being selected such that, in relation to the geometry of the bar, cracks in the surface in the region of the edges are detected. The pulsed current may derive from, say, a 50 or 60 Hz line source subjected to half-wave rectification; preferably pulse frequencies of 20 to 100 Hz are used. Periodically, or prior to each pulse, an erasing pulse is passed through the bar in the opposite direction to eliminate the residual magnetism from the previous scanning pulse or pulses. Hence the magnetization pulse is applied only to a nonmagnetized or previously demagnetized body.

3,657,639

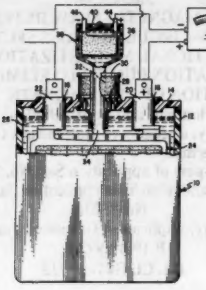
METHOD AND APPARATUS FOR MEASURING THE STATE OF CHARGE OF A BATTERY USING A REFERENCE BATTERY

Eugene A. Willihnganz, Lafayette Hill, Pa., assignor to ELTRA Corporation, Toledo, Ohio

Filed June 22, 1970, Ser. No. 47,935
Int. Cl. G01n *27/46*
U.S. Cl. 324—29.5 **8 Claims**

A device for testing storage batteries particularly of the lead-acid type to determine whether the individual cells of the battery are accepting charge and are in suitable condition

to perform their intended function, which comprises a miniature reference cell cooperating with the cell being tested by means of a tube filled with electrolyte in electrical circuit with the cell electrolyte, so that electrical potentials between



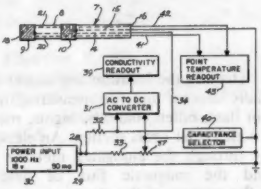
the negatives of the reference cell and the test cell, and also the potentials between the positives can be determined by a suitable voltmeter to indicate the condition of the respective negative and positive plates of the cell being tested.

3,657,640

GLASS CONDUCTIVITY AND TEMPERATURE PROBE

James W. Jelinek, Lancaster, Ohio; Joseph J. Kozlowski, and Jack E. Gooding, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.

Filed Feb. 5, 1969, Ser. No. 796,682
Int. Cl. G01r *27/42, 27/02*
U.S. Cl. 324—30 R **4 Claims**



A device for measuring the conductivity and/or temperature of glass in molten state. A probe including a hollow elongated member of nonconductive material has a pair of spaced external bands of conductive material near one end with an internal lead from each band extending to the other end of the elongated member. The leads are connected with power input means and an AC to DC converter, the latter of which is connected with a voltage readout to supply direct voltages thereto which are indicative of the conductivity of the molten glass between the bands on the probe. In addition, a thermocouple is positioned within the elongated member at the end with the bands thereon with leads therefrom being connected with a temperature readout that is externally positioned with respect to the probe.

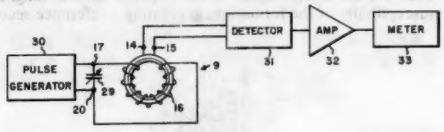
3,657,641

ANISOTROPIC THIN FILM PLATED WIRE MAGNETOMETER UTILIZING A COIL OF PLATED WIRE HAVING A PLURALITY OF TURNS

Vahram S. Kardashian, Plymouth Village, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 11, 1970, Ser. No. 45,466
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 R **6 Claims**

A thin film plated wire magnetometer in which the plated wire configurations are arranged to provide a very sensitive and compact instrument. The device is sensitive to magnetic field variations in the order of a fraction of one gamma. A plated wire is wound a number of turns around a cylindrical or rectangular core, the plated wire acting as both sensor



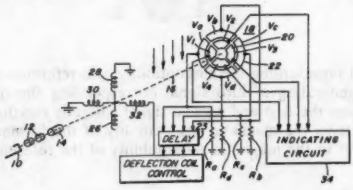
material and pickup coil. A high frequency energized driver coil is wound over the plated wire sensor coil, in one embodiment the driver coil is a toroidal winding.

3,657,642

ION-FOCUSED ELECTRON BEAM DIRECTIONAL MAGNETOMETER

Michael A. Goldman, Pikesville, and Harry Goldie, Randallstown, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1969, Ser. No. 862,278
Int. Cl. G01r *33/02*
U.S. Cl. 324—44 **7 Claims**



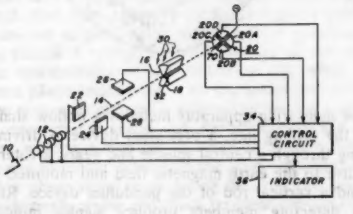
Described is an electron beam magnetometer of the type adapted to detect disturbances in magnetic fields, particularly the magnetic field of the earth. This is accomplished by means of a space-charge-neutralized low voltage electron beam. Positive ions, obtained either by ion injection or weak ionization of a low pressure gas within an envelope through which the electron beam passes, hold the beam together along its path. The beam is normally centered by means of conventional horizontal and vertical deflection coils. Disturbances in a magnetic field traversing the beam cause it to deflect; and this deflection is sensed to indicate the disturbance.

3,657,643

CONTROL SYSTEM FOR ELECTRON BEAM MAGNETOMETER SENSOR

James F. Nicholson, Severna Park, and Clarence Williams, Baltimore, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 30, 1969, Ser. No. 862,375
Int. Cl. G01r *33/02*
U.S. Cl. 324—44 **4 Claims**



Described is a control system for an electron beam magnetometer sensor of the type adapted to detect disturbances in magnetic field, particularly the magnetic field of the earth,

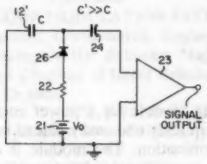
by means of a vacuum tube containing an electron gun which emits an electron beam and directs it between spaced pole pieces located within the envelope of the vacuum tube itself. The earth's magnetic field surrounding the tube is concentrated at the gap between the pole pieces such that the presence of a magnetically permeable body near the tube will alter the magnetic field intensity across the gap and cause the electron beam to deflect. The invention resides in the provision of electrical circuitry for sensing this deflection and for indicating the existence of a disturbance and its magnitude, which circuitry is capable of detecting small time varying signals in the presence of a strong static field.

3,657,644

THERMODIELECTRIC RADIOMETER UTILIZING POLYMER FILM

Benjamin H. Beam, Sunnyvale, and Larry D. Russell, San Jose, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Nov. 12, 1968, Ser. No. 774,733
Int. Cl. G01r *27/26*; G01t *1/16*; H01g *7/04*
U.S. Cl. 324—61 R **8 Claims**



A thermodielectric radiometer employing a polymer film or a capacitor dielectric. The film is charged to a suitable voltage gradient and, when it is heated by absorbed radiation, it produces a proportional open-circuit voltage increment which can be measured to provide an indication of the total energy or power of a short-duration pulse of radiant flux.

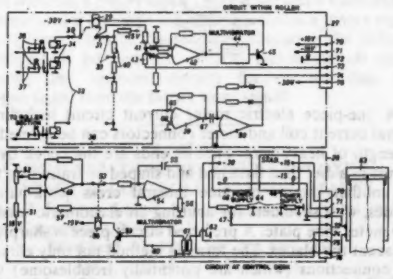
The invention described herein was made by employees of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

3,657,645

THICKNESS MEASURING DEVICE HAVING A SEGMENTED ROLLER AND HIGH GAIN AMPLIFIER

Emile Van Nueten, Herentals, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium

Filed Apr. 11, 1969, Ser. No. 815,386
Claims priority, application Great Britain, Apr. 11, 1968, 17,621/68
Int. Cl. G01n *27/02*
U.S. Cl. 324—65 R **4 Claims**



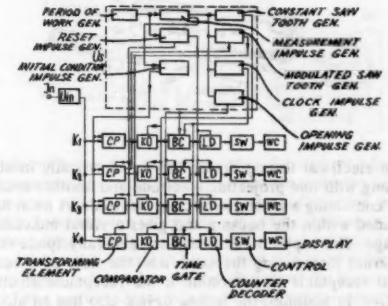
The thickness of an electroconductive coating on an electrically non-conductive web is measured in the transverse direction by an arrangement including a first roller connected to an AC tension and a second roller having a plurality of roller sections located in close side by side insulated relation transversely across the web, electric change-over contacts movable between an inoperative position connecting under the control of an appropriate controller, the roller sections in succession to the input of a high gain amplifier with resistive feedback, and a measuring device for measuring the output signal of the amplifier.

3,657,646

METHOD AND APPARATUS OF AUTOMATIC ESTIMATION OF NONREGULAR CURVES, ESPECIALLY ELECTROMIOGRAPHIC CURVES AND THE DIGITAL SYSTEM FOR REALIZATION OF THE METHOD

Wojciech Zmyslowski, Warszawa; Zofia Decowska, Warszawa; Ryszard Gawronski, Warszawa; Zdzislawa Borejko, Warszawa; Marek Decowski, Warszawa, and Janusz Wirski, Konstancin, all of Poland, assignors to Polska Akadamia Nauk

Filed Dec. 18, 1969, Ser. No. 886,093
Claims priority, application Poland, Dec. 20, 1968, P 130689
Int. Cl. G01r *23/16*
U.S. Cl. 324—77 A **7 Claims**



A method and apparatus for analyzing an irregular signal and providing a digital read-out in which the signal is applied to four processing channels. In a first channel, a coefficient of interference is obtained by counting transitions of the signal through several values, multiplying the sum of the transitions. In a second channel for obtaining mean peak value, the signal is rectified, supplied to a comparator also fed with a constant amplitude saw tooth wave and the time interval obtained between the initiation of the saw tooth wave and the instant when the saw tooth wave potential is equaled by a potential representing the signal intensity. In a third channel, a duty factor is obtained by dividing the signal after it has been integrated by its mean peak value. In a fourth channel the number of groups of impulses in the signal is determined.

3,657,647

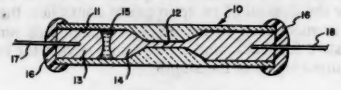
VARIABLE BORE MERCURY MICROCOULOMETER

Curtis C. Beusman, Mount Kisco, and Eugene P. Finger, Brewster, both of N.Y., assignors to Curtis Instruments, Inc.

Continuation-in-part of application Ser. No. 683,903, Nov. 17, 1967, now abandoned. This application Feb. 10, 1970, Ser. No. 10,179
Int. Cl. G01r *27/22*; G01n *27/42*
U.S. Cl. 324—94 **9 Claims**

An electrochemical coulometer having a bore of varying cross section is disclosed. The resistance of the coulometer

varies with time in a manner corresponding to the bore cross section as electric current is passed through the device causing the electrolyte in the coulometer to take on varying configurations within the bore.

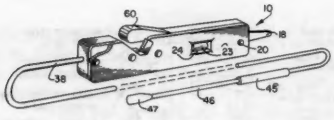


3,657,648

ELECTRICAL TESTING DEVICE

Elmer K. Malme, St. Charles, Ill., assignor to Wire Sales Company, Chicago, Ill.

Filed Feb. 8, 1971, Ser. No. 113,479
Int. Cl. G01r *13/36, 19/14*
U.S. Cl. 324—122 **2 Claims**



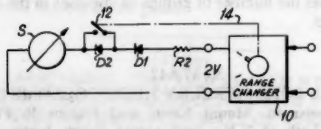
An electrical testing device has an electrically insulating housing with one projecting electrode and another insulated wire containing a second projecting electrode. A neon tube is included within the housing and gives a visual indication of voltage. The exposed electrodes are generally spade-shaped to permit introducing the same into the slots of a conventional receptacle to determine if the receptacle electrodes are live. In addition, the testing device also has an auxiliary electrode within a slotted portion of the housing.

3,657,649

METER FOR MEASURING DIFFERENT RANGES OF ALTERNATING ELECTRICAL QUANTITIES

Roberto Odorici, Via Rutilia, Milan, Italy

Continuation-in-part of application Ser. No. 810,510, Mar. 26, 1969, now abandoned. This application Nov. 20, 1970, Ser. No. 91,499
Claims priority, application Italy, Apr. 4, 1968, 14824 A/68
Int. Cl. G01r *15/08, 15/10*
U.S. Cl. 324—115 **4 Claims**



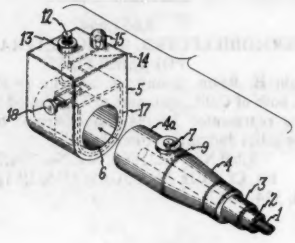
A meter for measuring alternating electrical quantities. The meter is particularly designed to provide readings of different ranges of these quantities on the same scale. An electrical circuit of the meter is provided with a pair of rectifiers which are connected in series, and a range changer coacts with one of the rectifiers for connecting it into and disconnecting it from the circuit when the range changes.

3,657,650

CURRENT AND VOLTAGE MONITORING MODULE FOR ELECTRIC CONDUCTOR TERMINATIONS

Richard H. Arndt, Lenox, Mass., assignor to General Electric Company

Continuation-in-part of application Ser. No. 694,720, Dec. 29, 1967, now abandoned. This application Sept. 8, 1969, Ser. No. 855,912
Int. Cl. G01r *1/22, 19/14*
U.S. Cl. 324—126 **2 Claims**



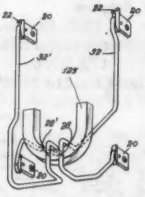
A monitoring module for a power conductor termination adapted to be quickly and easily placed in operating position on such a termination. The module is equipped to house either or both current and voltage monitoring means for detecting variations in current and voltage on the power conductor.

3,657,651

ONE PIECE METER CURRENT CIRCUIT

Richard A. Road, Lafayette, and James H. Schlatter, Frankfort, both of Ind., assignors to Duncan Electric Company, Inc., Lafayette, Ind.

Filed June 2, 1969, Ser. No. 829,278
Int. Cl. G01r *11/02*
U.S. Cl. 324—137 **11 Claims**



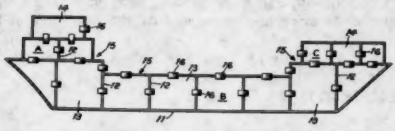
A one-piece electric meter current circuit including integral current coil and meter connectors can be formed from a length of heavy wire. First its ends are thickened by axial thrust in a die, then flattened and shaped by transverse thrust in another die to produce integral cross work-hardened blades, with shoulders for abutting an elastomeric washer at the meter base plate. A preferred circuit piece is sharply bent adjacent the blades. The forming method not only eliminates all connections (which are potentially troublesome) within the electric meter current circuit, but moreover provides work-hardened, strengthened portions in crucial regions such as at the neck of the blades.

3,657,652

INTER-COMPARTMENT COUPLING DEVICE

Harry R. Smith, Verona, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 17, 1969, Ser. No. 885,773
Int. Cl. H04b 1/38; H01q 1/12, 1/34
U.S. Cl. 325—15 6 Claims



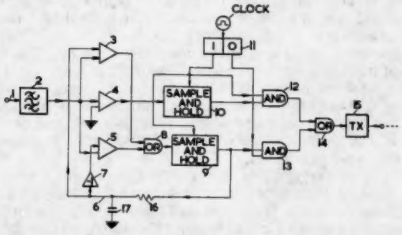
Inter-compartment coupling devices are described for improving on-board communications for large ships. The described devices permit efficient electrical coupling between compartments so that communications by hand-held transceivers is possible. The couplers described include a slot antenna, loop and monopole antennas which interconnect the various areas on either side of a partition or deck.

3,657,653

PULSE CODE MODULATION SYSTEM

Roger Martin Wilkinson, Christchurch, England, assignor to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 27, 1970, Ser. No. 32,322
Claims priority, application Great Britain, Apr. 30, 1969, 22,042/69
Int. Cl. H03k 13/22
U.S. Cl. 325—38 B 15 Claims



A pulse code telecommunications system in which samples of an analogue signal to be transmitted are each represented by a binary word. In each binary word, one signal bit represents the polarity of the sample with respect to a reference level and one or more further signal bits represent the magnitude of the sample with respect to a second, variable, reference level which is derived from the coded representation of the magnitudes of preceding samples. The system includes a binary signal multiplexer and a transmitter.

A receiver for use with the system includes a binary signal demultiplexer, circuits for correctly allocating the polarity and magnitude bit signals to polarity and magnitude signal channels, and decoder circuits for reconstituting the analogue signal from the binary word signal.

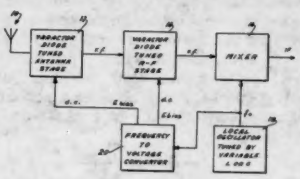
3,657,654

COMMUNICATIONS RECEIVER EMPLOYING VARACTOR CONTROLLED TUNING STAGES

Vincent P. Friberg, Leonia, N.J., assignor to General Instrument Corporation, Newark, N.J.

Filed Sept. 11, 1969, Ser. No. 857,150
Int. Cl. H04b 1/16; H03j 3/28
U.S. Cl. 325—452 11 Claims

In a communications receiver the local oscillator output signal is converted to a voltage signal proportional to the oscillator frequency. That voltage signal is applied to the voltage-sensitive tuning elements in the receiver's tuning



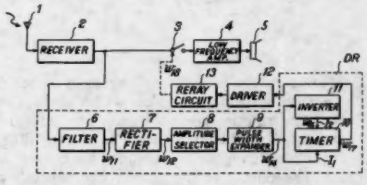
stages to vary the tuning parameters of these elements. An improved frequency-to-voltage converter effectively converts the oscillator output to the tuning voltage signal.

3,657,655

DETECTION SYSTEM FOR CONTROL INFORMATION

Masayuki Fukata, 94 Shimorenjaku, Mitaka-shi, Tokyo, Japan

Filed Apr. 15, 1969, Ser. No. 816,295
Int. Cl. H04b 1/16
U.S. Cl. 325—64 5 Claims



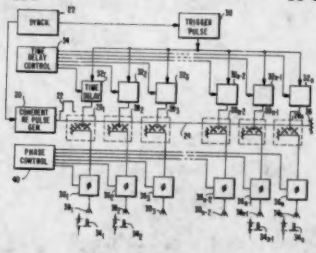
Disclosed herein is a detection system for control information transmitted from the sending side to the receiving side in a broadcast system, in which the control information is detected in consideration of the following two conditions: (1) if a control signal representative of the control information is intermitted by the control at the sending side or by noise, the control signal is deemed continuous in case of the intermitted time of the control signal is less than a predetermined first time (*t*); and (2) if a signal deemed continuous exceeds a predetermined second time (T) longer than the first time (t), this signal is decided as the control information.

3,657,656

SWITCHED HIGH POWER PULSED ARRAY

Herbert W. Cooper, Hyattsville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 8, 1970, Ser. No. 79,182
Int. Cl. H04b 3/02
U.S. Cl. 325—130 11 Claims



A time domain power divider wherein a relatively long coherent RF pulse is separated into a plurality of relatively shorter length pulses having substantially the same peak power as the input pulse by coupling a plurality of low loss type waveguide switches to a common waveguide section

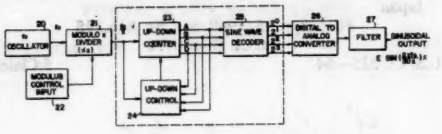
propagating a relatively long input pulse. The plurality of waveguide switches are selectively separated over a length of the waveguide and operated in timed relationship with respect to the input pulse wherein the pulsewidth of the relatively long input pulse is at least equal to the total span of the plurality of waveguide switches. The relatively shorter coherent RF pulses formed from the input pulse are then respectively coupled to separate antenna means through controlled phase shifters to provide a phase array output of microwave energy.

3,657,657

DIGITAL SINE WAVE GENERATOR

William T. Jefferson, 1461 Montelegre Drive, San Jose, Calif.

Filed Aug. 3, 1970, Ser. No. 60,266
Int. Cl. H03b *19/00*; **H03k** *13/00*
U.S. Cl. 328—14 **10 Claims**



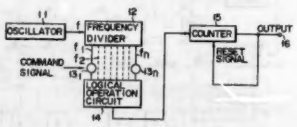
An accurate source of constant frequency pulses drives an adjustable modulus digital divider, which divides the input pulse repetition rate by exact integers. The pulse repetition rate of the output of the divider is made directly proportional to the desired frequency of a sine wave that is to be generated. The output of the divider continuously clocks a four-bit binary up-down counter from the all-zero condition to the all-one condition and then back down cyclically. This up-down counter programs a digital sine wave decoder in which logic circuits convert the binary pattern from the output of the up-down counter into a binary pattern that is a stepwise approximation to a sine wave. A conventional digital-to-analog converter converts the binary pattern from the sine wave decoder into a corresponding analog signal, which is filtered to remove undesirable frequency components. The result is a reasonably pure sine wave whose frequency is accurately controlled by the pulse repetition rate from the variable modulus divider.

3,657,658

PROGRAM CONTROL APPARATUS

Moritada Kubo, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Dec. 11, 1970, Ser. No. 97,285
Claims priority, application Japan, Dec. 13, 1969, 44/99842
Int. Cl. H03k *1/00*
U.S. Cl. 328—61 **10 Claims**



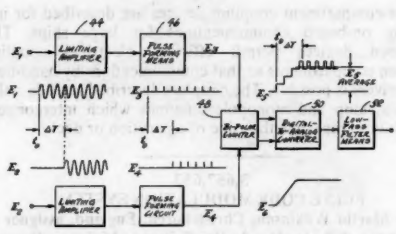
Program control apparatus for generating programmed control signals comprises a clock pulse oscillator, a frequency divider or multiplier for converting the clock pulse into a plurality of frequency signals of different frequencies, a logical operation circuit for selecting the frequency signals in accordance with a command signal, a counter for counting a preset number of the outputs from the logical operation circuit for successively providing the programmed control signal, and means responsive to each control signal for resetting the counter.

3,657,659

METHOD AND MEANS FOR MEASURING PHASE DIFFERENCE

Robert P. Johnson, Sun Valley, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed July 13, 1964, Ser. No. 382,697
Int. Cl. H03d *13/00*
U.S. Cl. 328—133 **1 Claim**



1. Apparatus for obtaining an output signal whose value corresponds to the phase difference between two sinusoidal waves displaced in time comprising, in combination:

a first limiting amplifier connected to receive the earlier of said sinsusoidal waves as its input;

a first pulse-forming means connected to receive as its input the output of said first limiting amplifier and to produce a spike pulse whenever a positive-going portion of the output wave of said first limiting amplifier crosses its zero axis;

a second limiting amplifier connected to receive the later of said sinusoidal waves as its input;

a second pulse-forming means connected to receive as its input the output of said second limiting amplifier and to produce a spike pulse whenever a positive-going portion of the output wave of said second limiting amplifier crosses its zero axis;

a bi-polar counter having a positive input and a negative input, said counter being connected to receive at its positive input the output of said first pulse-forming means and at its negative input the output of said second pulse-forming means, said counter providing a positive count for each pulse at its positive-signal input and subtracting one count for each pulse at its negative-signal input;

a digital-to-analog converter connected to receive as its input the output of said bi-polar counter and to provide a step output comprising a fixed increase in value for each pulse at the positive-signal input of said bi-polar counter and a corresponding fixed decrease in value for each pulse at the negative-signal input of said bi-polar counter, the increases and decreases being cumulative in effect; and

low-pass filter means connected to receive as its input the output of said digital-to-analog converter, said filter means acting to average out the changes in the output wave of said converter.

3,657,660

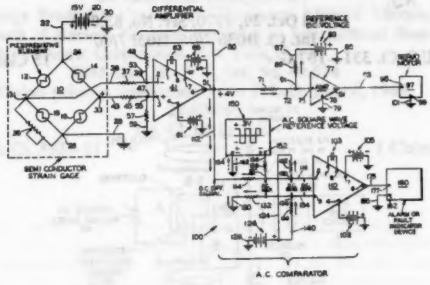
ERROR DETECTING AND FAILURE INDICATING SYSTEM AND METHOD IN A SERVO LOOP

George H. Pfersch, Randolph Township Morris County, N.J., assignor to The Bendix Corporation

Filed July 24, 1970, Ser. No. 62,215
Int. Cl. G06g *7/14*
U.S. Cl. 328—148 **8 Claims**

An error detecting and failure indicating system and method in a servo loop in which an electrical bridge network

is provided having a D.C. output to operate a differential amplifier, and a comparator including another differential amplifier responsive to both the D.C. output and an A.C. square wave reference voltage, one of the arms of the electrical bridge network being purposely unbalanced so as to provide over a predetermined control range of the servo loop a D.C. output signal voltage which may be varied over the control



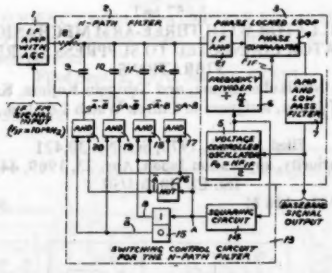
range in accordance with a sensed condition and which output signal voltage upon a failure arising in the system may exceed or decrease below preset limits of the predetermined control range set by the peaks of the A.C. square reference voltage so as to cause the differential amplifier of the comparator to provide a steady D.C. output voltage of a polarity dependent upon the sense of the failure arising in the system.

3,657,661

FM DEMODULATOR SYSTEM

Harold F. Jarger, Rochelle Park, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 16, 1970, Ser. No. 46,707
Int. Cl. H03d 3/00
U.S. Cl. 329—122 **10 Claims**



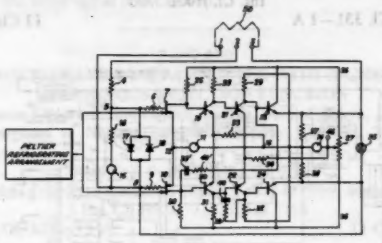
An improved threshold performance for an FM demodulator is obtained by employing the combined features of a phase locked loop demodulator and a N-path (digital) filter. The bandwidth of the filter is adjusted to approximately two times the highest baseband frequency and its center frequency is determined by the switching frequency employed in the filter which is derived from the output signal of the phase locked loop's voltage control oscillator (VCO). The VCO output signal is determined by the instantaneous IF input frequency resulting in an IF filter having a minimum bandwidth that tracks the input IF frequency.

3,657,662

ELECTRONIC APPARATUS FOR CONVERTING IMPEDANCES AND ELECTRICAL MEASUREMENTS

Joseph Antoine Lemouzy, 32 Boulevard de la Bastille, Paris 12, France

Filed July 18, 1969, Ser. No. 843,083
Claims priority, application France, July 30, 1968, 161091
Int. Cl. H03f 3/18
U.S. Cl. 330—17 **7 Claims**



This specification discloses an electronic apparatus of the tripole type for converting impedances. A transistorized differential symmetrical amplifier comprises first and second identical half-amplifiers which both have high input impedance and low output impedance.

A negative feedback connection exists between the input and output of the first half-amplifier. A tripole is formed by three connecting terminals connected respectively to the feedback connection, the input of the second half-amplifier, and the output of the second half-amplifier.

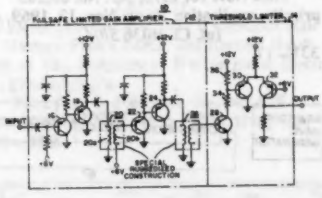
Substantially zero impedance exists at an output between the first and third terminals and at an input between the first and second terminals, and an extremely high impedance is present between the second and third terminals, when the second and third terminals are connected by a non-infinite impedance.

3,657,663

AC THRESHOLD AMPLIFIER FOR USE IN FAILSAFE APPLICATIONS

Richard S. Rhoton, Pittsburgh, and George M. Thorne-Booth, Murrysville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 752,870, Aug. 15, 1968, abandoned.
Filed May 27, 1970, Ser. No. 41,706
Int. Cl. H03f 1/00
U.S. Cl. 330—165 **4 Claims**



An AC amplifier having a built-in threshold has a circuit structure inherently providing a single predetermined output mode under any conditions of failure of its individual components or combinations thereof. The circuit employs the impedance transformation characteristics of unity gain amplifier stages coupled by step-up transformers to preamplify the signal. Another step-up transformer coupled the last gain stage to a transistor threshold circuit employing the forward conduction voltage of its base-emitter junction for the

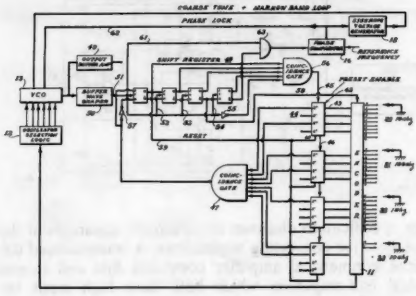
threshold action. The circuit is so arranged that its output mode under failure of components or combinations of components is the "absence of dynamic output."

3,657,664

FREQUENCY SYNTHESIZER

Werner Brack, Oyster Bay, N.Y., assignor to Communications Associates, Inc., Huntington Station, N.Y.

Filed Oct. 2, 1970, Ser. No. 77,504
Int. Cl. H03b *3/06*
U.S. Cl. 331—1 A **11 Claims**



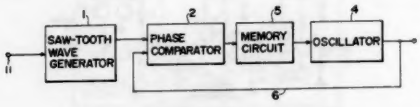
A frequency synthesizer having a phase lock loop for regulating a voltage controlled oscillator with reference to a stable oscillator frequency. The desired frequency is set on decade switches. An encoder converts the frequency value to a binary coded decimal equivalent nine's complement number and presets a decade counter. An offset frequency is preintroduced into the counter by fixing the maximum count. Upon counting the maximum count, a shift register is triggered and during the shifting operation, the system is reset. The maximum count is reduced by the number of stages in the shift register. A steering voltage generator incorporating a staircase generator and an electronically switched filter is placed in parallel with the phase lock loop, and provides a coarse tuning of the voltage controlled oscillator.

3,657,665

AUTOMATIC FREQUENCY CONTROL SYSTEM WITH MEMORY CIRCUIT FOR INCREASING CONTROL RANGE

Kenji Kimura, Tokyo, Japan, assignor to Shiba Electric Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1970, Ser. No. 88,263
Claims priority, application Japan, Nov. 13, 1969, 44/90455
Int. Cl. H03b *3/04*
U.S. Cl. 331—17 **5 Claims**



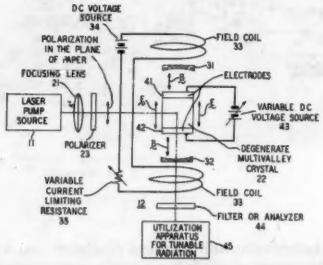
An automatic frequency control system has a phase comparator for comparing the phases of a sawtooth wave of a reference frequency and the output frequency of an oscillator and a memory circuit for descriminating or detecting the polarity of the phase difference from two kinds of stepped waveforms generated by the phase comparator in response to the polarity of the phase difference and for storing a DC analog potential in response to the detected polarity. The frequency of the oscillator is controlled by this DC analog potential.

3,657,666

SPIN-FLIP LIGHT SCATTERING AND GUNN EFFECT-TYPE OSCILLATIONS IN MULTIVALLEY SEMICONDUCTORS SUBJECT TO A MAGNETIC FIELD

Chandra Kumar Naranbhai Patel, Summit, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Oct. 29, 1970, Ser. No. 85,040
Int. Cl. H03b *7/06;* **H03f** *7/00*
U.S. Cl. 331—107 G **15 Claims**



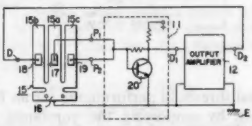
Improved stimulated spin-flip Raman scattering and Gunn effect-type oscillations are provided in degenerate multivalley semiconducting materials such as lead telluride. Both phenomena may be obtained in an apparatus of the same configuration either independently or simultaneously. Under the influence of an applied electric field, the stimulated spin-flip Raman scattering is characterized by an increase in its saturation level, thus providing increased Raman oscillator output power. The Gunn effect-type oscillations are of the microwave frequency range and can be coupled to an external circuit to give a microwave power output. Tunability in both cases is achieved by varying an applied magnetic field which determines the spacing between the spin sublevels of the Landau levels in the semiconductor.

3,657,667

OSCILLATOR WITH THREE-ARM MECHANICAL VIBRATOR CONNECTED TO SUPPRESS SPURIOUS VIBRATIONS

Yasuhiko Nishikubo, Iruma, and Tsutomu Kojima, Kawagoe, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1970, Ser. No. 30,421
Claims priority, application Japan, Apr. 23, 1969, 44/36703
Int. Cl. H03b *5/30*
U.S. Cl. 331—116 M **9 Claims**



A piezo-electrically driven oscillator assembly, comprising a mechanical vibrator; piezo-electric elements attached thereto; and an electronic amplifier electrically connected with said piezo-electric elements, said assembly being characterized in that said vibrator is a three-arm type mechanical vibrator; said piezo-electric elements comprise two sensing

piezo-electric elements and a sole driving piezo-electric element, each of said elements being glued to one of said three arms, with the arrangement of said elements and the structure of said amplifier so designed and arranged to substantially suppress spurious oscillation signals.

3,657,668

HYBRID T-JUNCTION CONSTRUCTED IN WAVEGUIDE HAVING A CUT-OFF FREQUENCY ABOVE THE OPERATING FREQUENCY

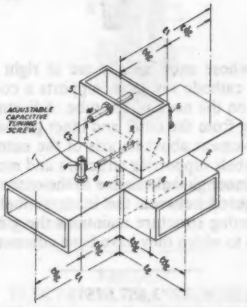
George Frederick Craven, and Raymond Richard Thomas, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 25, 1970, Ser. No. 40,074

Claims priority, application Great Britain, June 6, 1969, 28,698/69

Int. Cl. H01p *5/12*

U.S. Cl. 333—11 **1 Claim**



A hybrid T-junction constructed in waveguide for operation below its cut-off frequency. The series arm of the hybrid provides a parallel resonant circuit in series with the symmetrical arms of the hybrid. The shunt arm provides a series resonant circuit at the midpoint of the series arm. The equivalent circuit is a lumped circuit bridged-T, which exhibits the properties of balance and isolation associated with bridge networks.

3,657,669

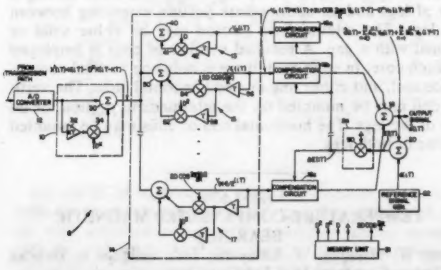
FREQUENCY DOMAIN ADAPTIVE EQUALIZER

John G. Proakis, Waltham, Mass., assignor to GTE Laboratories Incorporated

Filed Sept. 2, 1970, Ser. No. 68,897

Int. Cl. H04b *3/04*

U.S. Cl. 333—18 **10 Claims**



A frequency domain adaptive equalizer employs a first filter, having a plurality of periodically spaced zeros in its transfer characteristics, coupled to a second filter that includes a plurality of tuned circuits, each circuit having two poles in its transfer characteristics. The two filters are designed such that each of the zeros of the first filter are coincident with the poles of a separate tuned circuit of the second filter. Associated with each tuned circuit is a compensation circuit coupled to a summation circuit which combines the output signals of all of the compensation circuits to form a composite signal. A comparator circuit compares the composite signal thus generated with a stored reference signal to generate an error signal which is directed back to the compensation circuits to automatically adjust its parameters such that the error signal is minimized.

3,657,670

MICROWAVE BANDPASS FILTER WITH HIGHER HARMONICS REJECTION FUNCTION

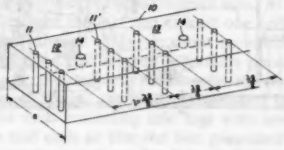
Susumu Kitazume, and Osamu Kasuga, both of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Feb. 9, 1970, Ser. No. 9,926

Claims priority, application Japan, Feb. 14, 1969, 44/11376

Int. Cl. H03h *7/10;* **H01k** *7/06*

U.S. Cl. 333—73 W **11 Claims**



A rectangular waveguide bandpass filter for transmitting fundamental electromagnetic waves f_0 in a fundamental mode TE_{101} and attenuating second harmonic waves $2f_0$ therein, comprising two susceptance elements spaced apart a distance of one-third waveguide wavelength in a lengthwise direction interiorly of the waveguide to form a resonant cavity for passing a frequency band including the fundamental wave f_{101}, attenuating the second harmonic wave $2f_{101}$, and preventing resonant frequencies of modes higher than the fundamental mode TE_{101} from decreasing into a frequency region below the second harmonic; and one or two adjustable screws disposed between the two susceptance elements in one or both waveguide wide walls to project into the interior of the cavity at a position which is one-twelth of the one-third waveguide wavelength susceptance element spacing and which is from an adjacent narrow waveguide wall one-third of the overall distance between the two narrow waveguide walls whereby the screws are restricted to function as one or two capacitive elements only for the TE_{101} mode.

3,657,671

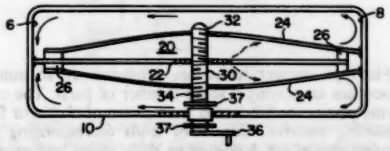
HYBRID TUNABLE CAVITY RESONATOR

Robert W. Masters, Falls Church, and Herbert Hanft, Alexandria, both of Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 5, 1969, Ser. No. 847,539

Int. Cl. H01p *7/04;* **H03h** *13/00;* **H03j** *3/20*

U.S. Cl. 333—82 B **13 Claims**



A tunable cavity resonator of the hybrid coaxial reentrant cavity type of configuration wherein the centerline structure conductively connecting the two end walls of the cavity in-

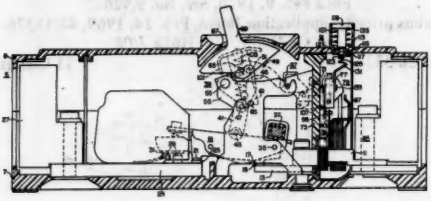
cludes a plurality of elongated conductors each directly connected electrically at one end only to one or the other end wall within the cavity and disposed in lapped and spaced relationship to each other with means for varying the spacing between the conductors to alter the distributed capacitance thereinbetween whereby the cavity may be tuned.

3,657,672

CIRCUIT BREAKER WITH MANUAL TRIP STRUCTURE

Robert H. Flick; Glenn R. Thomas, both of Beaver, and John Majcher, Beaver Falls, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 24, 1970, Ser. No. 75,198
Int. Cl. H01h 73/12
U.S. Cl. 335—21 7 Claims



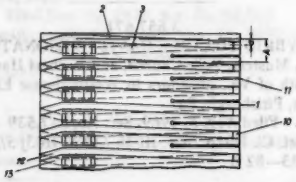
A molded case type circuit breaker comprises an externally operable trip structure manually operable to an actuating position to trip the breaker with means for padlocking the trip structure in the actuating position.

3,657,673

CONTACT SPRING ARRANGEMENT FOR ELECTROMAGNETIC MULTI-CONTACT RELAYS

Wolfgang Hagen, Leonberg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 29, 1969, Ser. No. 854,072
Claims priority, application Germany, Sept. 13, 1968, P 17 64 965.9
Int. Cl. H01h 1/06
U.S. Cl. 335—199 6 Claims



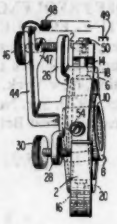
Flat-type contact relays are produced by an automatic procedure employing a small number of parts. The contact spring planes are fabricated from plates of elastic or flexible insulating material. Conductor leads corresponding to the contact springs are deposited on these plates by a printing or etching procedure. The plates have embossed areas which facilitate piling, stacking, adjusting and fixing the plates to one another and to the relay core.

3,657,674

COIL SUSPENSION ARRANGEMENT FOR A CATHODE RAY TUBE

Freeland Robert Goldammer, Princeton, and Harold Denton Albrecht, Jr., Camden, both of N.J., assignors to RCA Corporation

Filed Aug. 28, 1970, Ser. No. 67,755
Int. Cl. H01f 7/00
U.S. Cl. 335—210 12 Claims



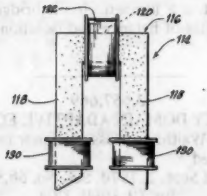
A gimbals whose axes initially are at right angles to the long axis of a cathode ray tube, supports a coil, such as the focusing coil, on the neck of the tube. Adjustment screws in arms extending from the outer and inner gimbals, respectively, permit movement about its axis of the outer gimbal relative to the gimbals supporting structure and movement about its axis of the inner gimbal relative to the outer gimbal. A single spring secured between the inner gimbal arm and the gimbals supporting structure maintains the gimbals and coil in the position to which they have been adjusted.

3,657,675

CONVERGENCE UNITS FOR COLOR TELEVISION PICTURE TUBES

Albert M. Anthony, Conneaut, and Richard J. Anthony, Ashtabula, both of Ohio, assignors to Tracor, Inc., Austin, Tex.

Filed July 16, 1970, Ser. No. 55,387
Int. Cl. H01f 7/00
U.S. Cl. 335—210 14 Claims



Generally U-shaped cores are employed, each having a pair of legs and an intermediate portion extending between the legs. The intermediate portion may be either solid or formed with a gap. A reduced number of coils is employed on each core. In each case, there is only one vertical convergence coil, and either one or two horizontal coils. The vertical coil may be mounted on the intermediate portion, or on one of the legs. The horizontal coil or coils may be mounted on one or both legs.

3,657,676

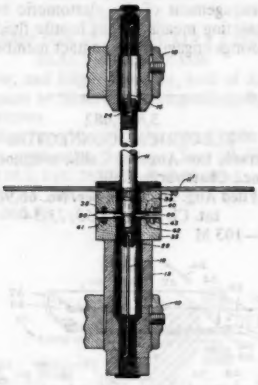
TEMPERATURE-COMPENSATED MAGNETIC BEARINGS

James W. Milligan, W. Lafayette, Ind., assignor to Duncan Electric Company, Inc., Lafayette, Ind.

Filed Aug. 26, 1970, Ser. No. 66,917
Int. Cl. H01f 7/00
U.S. Cl. 335—217 4 Claims

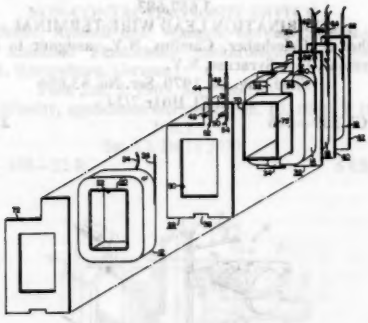
In a watthour meter having magnetic suspension of its disk, variations of vertical disk positioning in the gaps of the driv-

ing element, with changes in temperature, are reduced or avoided by temperature compensation of the suspension



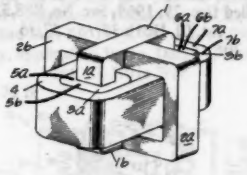
magnets. The suspension magnets use a material of relatively low cost even though it has a relatively high temperature coefficient of remanence.

3,657,677
ELECTRICAL TRANSFORMER
Clarence W. Hunt, Transfer; Ralph W. Johnston, and Donald S. Stephens, both of Sharpsville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Original application June 20, 1969, Ser. No. 835,018, now Patent No. 3,609,859. Divided and this application Feb. 10, 1971, Ser. No. 114,207
Int. Cl. H01f *15/02, 27/30*
U.S. Cl. 336—96 **7 Claims**



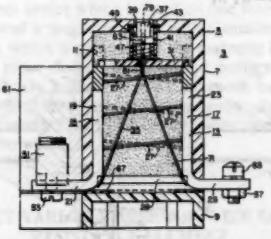
An electrical transformer wherein a plurality of electrical coils are wound on separate coil forms. The plurality of coils are each attached to a separate insulating washer member, with the coil leads also being fixed to the washer member. The coils and washer members are disposed on a common insulating tube in side-by-side relation, and a magnetic core is assembled about the coils, including a portion which extends through the opening in the common insulating tube. The coil forms and common insulating tube provide the coil to core insulation, while the insulating washer members provide barrier insulation between the coils.

3,657,678
MULTI-PURPOSE, MULTI-VOLTAGE TRANSFORMER
Carl A. Schwenden, 1218 C Edith Street, Alhambra, Calif.
Filed June 8, 1970, Ser. No. 44,214
Int. Cl. H01f *21/08, 27/28*
U.S. Cl. 336—160 **18 Claims**



Multi-purpose multi-coil single-unit transformer for accommodating a number of phases and voltages by making different appropriate external connections between the transformer coils. The core has at least two parallel legs connecting two appropriate yokes of transformer iron. At least one coil encircles each of the legs and at least one coil encircles all other coils. C-shaped magnetic shunt members abutting opposed faces of the yoke extend essentially parallel to the legs, and embrace the periphery of the coils, to create a magnetic-flux by-pass beyond the coils. Parallel and series connections of the coils encircling said legs with interconnections between said coils so that the flux generated by a primary a.c. current passing through said coils is forced to flow partially through the magnetic shunt members, and generates a secondary voltage in the coil encircling all other coils. Two sets of three identical coils wound on a two-leg core with magnetic shunt members, each set consisting of two coils wound around one leg each and a third coil encircling the two coils, operate to generate a secondary 3-phase a.c. current from one set of coils when the other set is energized by a primary 3-phase a.c. current. The multi-coil transformer operates as a saturable core reactor if a d.c. current is passed through one coil electrically insulated from the other coils with an a.c. current flowing through the other coils to a load, and with interconnections between the latter coils to render the desired reactance of the coil/core configuration.

3,657,679
FUSE DEVICE
James C. Wilson, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 31, 1970, Ser. No. 68,222
Int. Cl. H01h *85/30*
U.S. Cl. 337—244 **3 Claims**



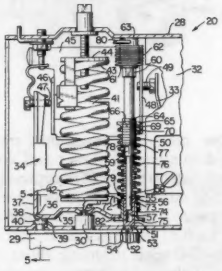
A fuse device with a conducting strain wire structure connected at the opposite ends thereof to spaced terminals and intermediate the ends thereof to an indicator to hold the indicator in an operative position until the fuse device blows whereupon the strain wire structure fuses to release the indicator which then moves to an indicating position.

3,657,680

TEMPERATURE CONTROL SYSTEM AND CONTROLLER AND METHOD THEREFOR OR THE LIKE

Joseph M. Stegina, Orange; Edward Perry Cumming, Milford, and Theodore Y. Korsgren, Orange, all of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 29, 1969, Ser. No. 888,522
Int. Cl. H01h *37/18;, 37/36*
U.S. Cl. 337—308 **8 Claims**



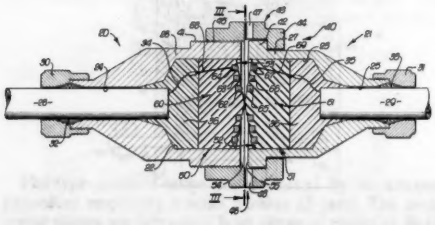
A housing carrying an actuator for controlling a heat exchanger and carrying a condition responsive means that is responsive to the output effect of the heat exchanger. Lever means operatively interconnect the condition responsive means to the actuator whereby the condition responsive means will tend to actuate the actuator when sensing an actuating condition of the heat exchanger and will tend to deactuate the actuator when sensing a heat actuating condition of the heat exchanger. An ambient temperature responsive device is operatively interconnected to the lever means to vary in relation to the ambient temperature sensed by the device only the deactuating condition that the condition responsive means must sense in operating the actuator so that at different ambient temperatures, the sensed temperature for causing the turn off of the heat exchanger will vary whereas the turn on temperature remains the same for any ambient temperature.

3,657,681

SELF-PURGING MULTI-CONTACT ELECTRICAL CONNECTOR

Chester B. Falkner, Whittier, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.

Filed May 29, 1969, Ser. No. 828,831
Int. Cl. H01r *13/52*
U.S. Cl. 339—61 M **7 Claims**



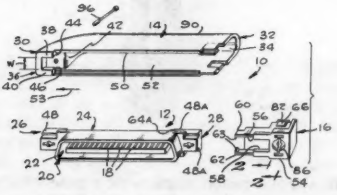
A self-purging, multi-contact electrical connector for use in a hostile fluid environment which includes a pair of connector housings each of which is connected to an electrical wire and each of which defines a chamber, mechanical means for releasably interconnecting the housings, an elastomeric body sealingly carried in each of the housing chambers and each of the bodies having exposed, aligned, convex surfaces, and each of the bodies carrying at least one electrically conducting contact member exposed at the convex surface and electrically connected to the wires, so that progressive engagement of the elastomeric bodies through the interconnecting means purges hostile fluid environment from the housings engaging the contact members in pressure contact.

3,657,682

ELECTRICAL CONNECTOR

Ralph T. Iversen, Los Angeles, Calif., assignor to Viking Industries, Inc., Chatsworth, Calif.

Filed Aug. 26, 1970, Ser. No. 66,981
Int. Cl. H01r *13/58, 13/54*
U.S. Cl. 339—103 M **7 Claims**



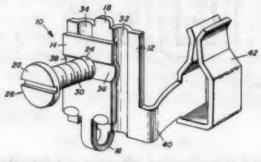
An electrical connector is described which includes male and female frames that can be rapidly coupled to interconnect multiple contact elements on each frame, and which also includes a hood for each frame to cover the face of the frame where wires can be soldered or crimped to the contact elements. Each frame and hood is constructed to allow the hood to be mounted in either of two positions, to lead the wires in either of two directions. Each end of a frame has a pair of flanges for reception at a first end of the hood. A clamp is provided which can firmly engage a second end of the hood and either end of the frame, to securely hold the frame to the hood, the clamp also serving to securely hold the wires which pass through the second end of the hood.

3,657,683

COMBINATION LEAD WIRE TERMINAL

Gunther S. Grieshaber, Camilus, N.Y., assignor to Pass & Seymour, Inc., Syracuse, N.Y.

Filed Aug. 14, 1970, Ser. No. 63,856
Int. Cl. H01r *7/24*
U.S. Cl. 339—246 **2 Claims**



A combination lead wire terminal comprising a base having a centrally positioned threaded hole therein and a clamping plate in spaced relation thereto provided with an opening aligned with the threaded hole. The base and clamping plate are connected for relative movement by means of a narrow strip integral with both the base and clamping plate. A terminal screw having a head and a threaded shank is threadedly mounted in the threaded hole in the base with the

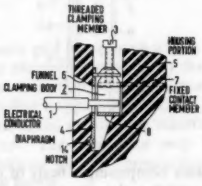
shank extending through the opening in the clamping plate whereby rotation of the terminal screw will cause the terminal head to engage the clamping plate and move it toward the base.

3,657,684

FRAME CLAMP FOR ELECTRICALLY CONNECTING ELECTRICAL LEADS

Gunther Rauter, and Edgar Wiessner, both of Amberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 17, 1970, Ser. No. 47,000
Claims priority, application Germany, June 19, 1969, P 19 31 175.2; Feb. 28, 1970, P 20 09 508.3
Int. Cl. H01r 7/08
U.S. Cl. 339—266 R **10 Claims**



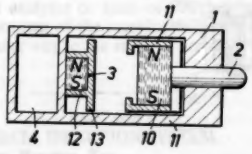
A plate-like diaphragm member has an insertion opening formed therethrough corresponding to and cooperating with the funnel of a housing for a frame clamp when the diaphragm member is in position in the housing. One of the walls of the funnel of the housing and the diaphragm member may be provided as an integral member of synthetic material. A clamping body is affixed to the diaphragm member at the insertion opening thereof so that an electrical conductor passes through the funnel and the opening into the clamping body. A threaded clamp threadedly coupled to the clamping body moves the bottom of the clamping body upward thereby bringing the electrical conductor into electrical contact with a fixed contact member in the clamping body.

3,657,685

NON-CONTACTING LIMIT SWITCH

Josef Pfeffer, Amtzell near Wangen, Germany, assignor to Rafi Raimund Finsterholze Elekbrotechnische Spezialfabrik, Ravensburg, Germany

Filed Jan. 3, 1969, Ser. No. 788,710
Claims priority, application Germany, Feb. 10, 1968, P 16 38 108.1
Int. Cl. H01v 5/00
U.S. Cl. 338—32 R **6 Claims**



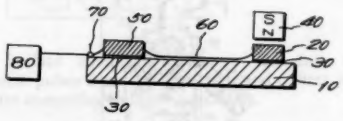
A contact-less limit switch for path-responsive release of switching procedures, which comprises a housing, a magnet producing a magnetic field and disposed in the housing. At least one field plate has electric current flowing therethrough, and is disposed within the range of the magnetic field. The resistance of the at least one field plate is variable by the magnetic field, and a member is provided which is operable from the outside for varying within selected limits the density or position of the magnetic field with respect to the field plate.

3,657,686

GALVANO-MAGNETRO EFFECT APPARATUS

Noboru Masuda, Kawaguchi, and Takeshi Hidai, Yokohama, both of Japan, assignors to Denki Onkyo Co., Ltd.

Filed Dec. 11, 1970, Ser. No. 97,098
Claims priority, application Japan, Dec. 17, 1969, 44/119915
Int. Cl. H01c 7/16
U.S. Cl. 338—32 H **7 Claims**



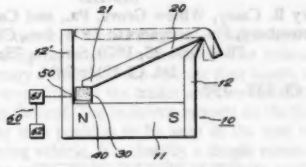
A galvano-magnetro effect apparatus comprised of a substrate with excellent electric insulating ability, at least one galvano-magnetro effect device which is fixed on the substrate, a magnet which is provided opposite to the device so that the magnetic flux is applied to the device and the density of the magnetic flux may be varied, and a load which is fixed on the substrate while being isolated from the device so that it is not affected by the magnetic flux of the magnet and is connected to the device with a conductor.

3,657,687

SWITCHING APPARATUS

Tunekazu Kobayashi, Kawasaki, Japan, assignor to Denki Onkyo Co., Ltd.

Filed Jan. 18, 1971, Ser. No. 107,367
Claims priority, application Japan, Jan. 19, 1970, 45/5634
Int. Cl. H01c 7/16
U.S. Cl. 338—32 **9 Claims**



A switching apparatus comprised of a U-shaped magnetic base, the opposed yokes of which are made of a material with a large saturation magnetic flux density, a rotary yoke which is made of the same material as the yokes of the base and is mounted on to a free end of one yoke of the base, a galvanomagnetro effect device which is fixed on one internal surface of the yoke, and a magnetic piece with a smaller saturation magnetic flux which is provided at the magnetic base so that the magnetic piece closely approaches or contacts the device and is magnetically isolated from the magnetic base, wherein the moving end of the rotary yoke is magnetically connected to and disconnected from the magnetic piece along with rotation of the rotary yoke.

3,657,688

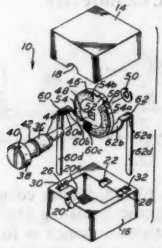
COMPACT VARIABLE RESISTOR WITH ROTARY RESISTANCE ELEMENT

Harry B. Casey, Willow Grove, Pa., and Carl E. Clark, St. Petersburg, Fla., assignors to TRW, Inc., Cleveland, Ohio

Filed June 16, 1970, Ser. No. 46,685
Int. Cl. H01c 9/02
U.S. Cl. 338—150 **20 Claims**

A variable resistor which is made up of a minimum number of parts so that it can be made small in size and yet be easily

assembled. Also, the variable resistor can be made as either a two terminal rheostat or a three terminal potentiometer. The variable resistor includes a hollow housing having a shaft rotatably mounted therein and projecting from a wall thereof so as to be rotatable from outside the housing. A rotor is on the shaft and has a resistance path and a contact path thereon with the contact path being electrically connected to one end of the resistor path. A pair of contacts are mounted



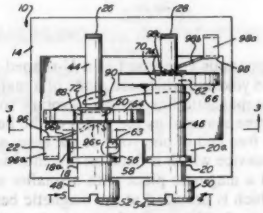
in the housing. Each of the contacts has a terminal extending through and projecting beyond the housing, and a finger which slidably engages either the resistance path or the contact path. For a three terminal potentiometer, a second contact path is on the rotor and is electrically connected to the other end of the resistance path. A third contact is in the housing and has a terminal extending from the housing and a finger slidably engaging the second contact path.

3,657,689

VARIABLE LOW NOISE ELECTRICAL RESISTOR WITH PLURAL VARIABLE RESISTORS CONNECTED IN SERIES

Harry B. Casey, Willow Grove, Pa., and Carl E. Clark, St. Petersburg, Fla., assignors to TRW, Inc., Cleveland, Ohio

Filed Sept. 25, 1970, Ser. No. 75,638
Int. Cl. H01c 9/04
U.S. Cl. 338—150 **19 Claims**



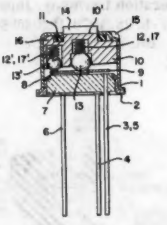
A rheostat which includes a hollow housing having a pair of rotors rotatably mounted therein, and a resistance path on each of the rotors. One of the resistance paths provides relatively large incremental changes in resistance value over a wide range of resistance values, and the other resistance path provides small incremental changes in resistance value over a range equal to each increment of the resistance value of the one resistance path. The resistance paths are connected in series and terminals, which extend from the housing, are electrically connected to the resistance paths. By rotating the rotors, any desired resistance value over a wide range of values can be obtained. In one form of the rheostat, a separate shaft is provided to rotate each rotor. In another form of the rheostat, a single shaft drives both rotors.

3,657,690

MINIATURE VARIABLE-RESISTANCE DEVICE WITH FLEXIBLE DISK CONTACT

Radovan Tavzes; Jelko Koron, and Evgen Kansky, all of Ljubljana, Yugoslavia, assignors to Institut Za Elekroniko In Vakuumsko Tehniko, Ljubljana, Yugoslavia

Filed Aug. 10, 1970, Ser. No. 62,419
Claims priority, application Yugoslavia, Aug. 11, 1969, P-2069/69
Int. Cl. H01c 9/02
U.S. Cl. 338—154 **10 Claims**



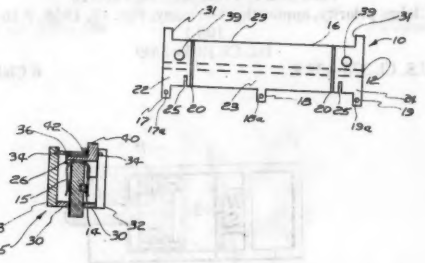
A potentiometer comprising a body of homogeneous vitreous material in which a plurality of wire leads are embedded flush with a surface of the vitreous body which is received in a metal frame. A cup-shaped housing encloses the flush surface of the body and engages the frame while receiving a rotatable plug having a boss with a screwdriver slot extending through this cover. An arcuate contact strip is applied, e.g. by vacuum depositing to the surface while a thin deformable plate yieldably overlies the contact strip in spaced relation therewith, the contact strip being angularly fixed upon rotation in the plug, a spring-loaded ball presses a limited region of the disk against the contact strip to form the wiper.

3,657,691

LINEAR POTENTIOMETER WITH SEGMENTED TERMINAL AND COLLECTOR MEANS

Jerzy J. Wilentchik, Yonker, N.Y.

Filed May 20, 1971, Ser. No. 146,738
Int. Cl. H01c 5/02
U.S. Cl. 338—182 **7 Claims**



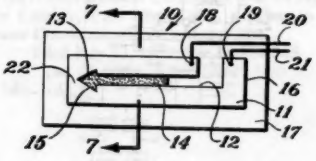
A resistance element disposed on a copper laminated epoxy baseboard is electrically connected by a spring wiper to a collector formed by the copper plate on said baseboard. Resistance terminals integral with the baseboard extend out of the housing enclosing the assembly element. The wiper is actuated by a slider movable along the element to vary resistance. A marker on the slider indicates the wiper position relative to a scale imprinted on the housing.

3,657,692

TRIMMER RESISTOR

Hans H. Wormser, New Milford, N.J., assignor to Markite Corporation, New York, N.Y.

Filed Mar. 12, 1971, Ser. No. 123,609
Int. Cl. H01c 1/00
U.S. Cl. 338—252 20 Claims



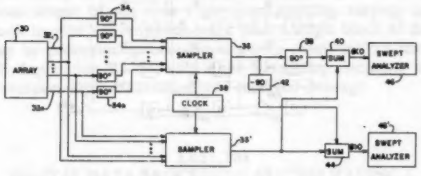
A variable resistance pad comprising a strip of conductive material which has a channel formed partly therein. Resistive material fills at least a portion of said channel which has a specified shape including a converging section. Electrical terminals are connected to the conductive material on opposite sides of the channel. The resistance may be varied by trimming away portions of the conductive material to decrease the channel length.

3,657,693

MULTIPLE BEAM SCANNED PLANAR ARRAY

Walton Graham, Roslyn; Sheldon Gardner, Dix Hills, Huntington, and John Cabot, Jackson Heights, all of N.Y., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 15, 1965, Ser. No. 507,961
Int. Cl. G01s 3/00
U.S. Cl. 340—6 R 6 Claims



Apparatus for determining the direction of arrival of an incoming wave front comprises a planar array of transducer elements arranged in N rows and N columns. The transducers are scanned serially in each row, and row by row, by a sequential sampler the output voltage of which comprises the sampled transducer voltages. A frequency spectrum analyzer such as a swept analyzer or bank of filters determines the frequency components of the sampler output which are related in a particular way to the angle of arrival of the incoming wave front.

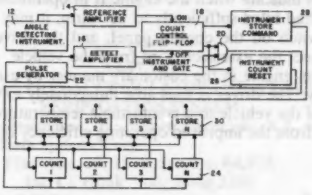
3,657,694

DATA INSERTION SYSTEM

James M. Lindsey, Houston, Tex.

Filed Nov. 21, 1969, Ser. No. 879,008
Int. Cl. G01v 1/22
U.S. Cl. 340—15.5 BH 16 Claims

The particular embodiment described herein as illustrative of one form of the invention utilizes an instrument system for detecting parameters of borehole conditions and storing data bits indicative of such parameters. A scan circuit determines the presence or absence of such stored data bits and causes a bit insert circuit to superimpose corresponding data pulses on a conductor supplying line power from the surface to the instrument system in the borehole. A synchronization pulse is also superimposed on the line power to distinguish series of



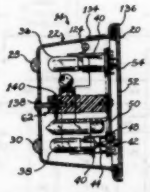
data bits. Surface equipment separates the data and synchronization pulses from the line power and utilizes such data pulses for computing wellbore conditions.

3,657,695

LEVELING INDICATOR

Robert C. Birmingham, Box 261 R 6, Adrian, Mich.

Filed Apr. 13, 1970, Ser. No. 27,641
Int. Cl. B60q 1/00
U.S. Cl. 340—52 H 7 Claims



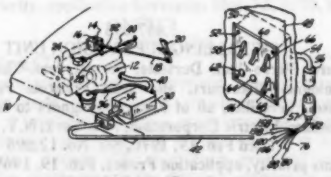
A leveling indicator is provided for house trailers and the like to aid in parking the trailer on the level. The indicator incorporates mercury switches which operate four lamps, two to indicate transverse tilting of the trailer and two to indicate longitudinal tilting thereof. The indicator mounts on the front wall of the trailer in a position to be seen in the rear view mirror of the towing vehicle. It is thereby a simple maneuver to manipulate the trailer back and forth at the site until all four lamps are off, indicating that the trailer is in a level attitude.

3,657,696

SYSTEM FOR THE REMOTE STARTING OF MOTOR VEHICLE ENGINES

Victor Lessard, 3335 Willow Street, and Gilles Morin, 3547 Weddel Street, both of Dearborn, Mich.

Filed June 15, 1970, Ser. No. 46,259
Int. Cl. B60g 1/00; B60k 33/02
U.S. Cl. 340—54 1 Claim



A system for the remote starting of motor vehicle engines consisting of an electrical control panel mountable in the

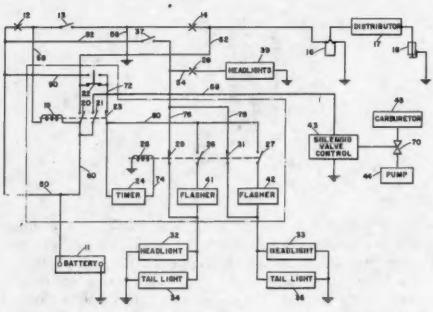
home, and detachably connected by an extension cord to the vehicle. Switches on the control panel and electrical components mounted on the vehicle enable the engine to be started from inside the home, and pilot lights adjacent the switches indicate when the engine is in operation. When the engine had idled sufficiently to be warm, it may be stopped by a switch on the control panel, and the driver can then disconnect the extension cord from the vehicle, and re-start the warm engine in the customary manner by using the ignition key. The driver is thus able immediately to heat the interior of the vehicle to a comfortable temperature, as well as benefit from the improved operating efficiency of a warm engine.

3,657,697

VEHICLE IGNITION SWITCH JUMP CIRCUIT RESPONSIVE DEVICE

Wilderich C. Schultz, San Diego, Calif., assignor to Frank Marino, Jr. and Hadrian J. Liberatore, San Diego, Calif., part interest to each

Filed June 1, 1970, Ser. No. 42,272
Int. Cl. B60r *25/10*
U.S. Cl. 340—64 **5 Claims**



A vehicle theft preventive device that is inserted into the ignition circuit and light circuit of a vehicle that, in response to jump circuiting or short circuiting the battery to the ignition system, the lights of the vehicle are caused to intermittently flash after a given time delay and a solenoid controlled valve is closed in the fuel system stopping fuel flow to the engine.

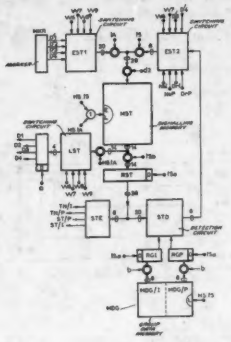
3,657,698

SIGNALLING SUPERVISION UNIT

Bernard Pierre Jean Durteste, Sevres; Jean-Claude Gadre, Boulogne-Billiancourt, and Jean Francois Pierre Julien Loisel, Versailles, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,698
Claims priority, application France, Feb. 19, 1969, 6904113
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1 **4 Claims**

A signalling supervision unit for pulse code modulation systems provides for detecting and interpreting signalling signals by comparing an incoming stream of signals with a stored state corresponding to the signals expected and storing any differences detected during the comparison.

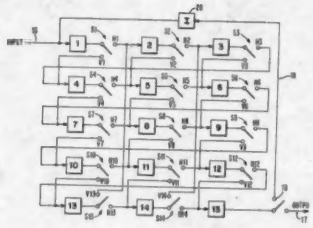


3,657,699

MULTIPATH ENCODER-DECODER ARRANGEMENT

Edouard Y. Rocher, Ossining, and Stanley E. Schuster, Granite Springs, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1970, Ser. No. 51,260
Int. Cl. G08c *25/00*
U.S. Cl. 340—146.1 **17 Claims**



A multipath encoder-decoder arrangement which consists of a plurality of storage devices such as memory cells, for example, which can be shifted from one series configuration into at least a second series configuration. The storage devices or at least a portion of them are switched from a first series path to a second series path. In one configuration, the outputs of all the storage devices are switched to the input of a succeeding storage device in a first path to the input of a different storage device in a second series path. In another embodiment, only a portion of the storage devices in one path are switched to form a series arrangement of storage devices in a second path in conjunction with fixed interconnections between certain other of the storage devices. By simply switching between paths, the order of information can be changed, i.e., interleaved, in such a way that errors which occur in bursts when transmitting data are spread out over the entire message with an inter-error space large enough to improve error correction. By providing control means which controls the shifting of data along the series configurations and the switching between configurations, in accordance with a given key, it is possible to scramble transmitted data at various levels of complexity. The complexity at one level, for example, is provided by a feedback loop connected between the input and output of the series configurations which permits data held in the series paths to be changed in both posi-

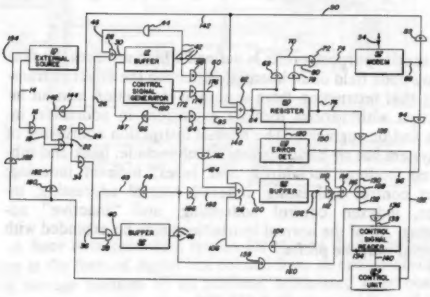
tion and polarity. Another level of complexity can be achieved by modifying the key with another key which has been logically combined with previously transmitted encoded data. After transmission, the data is received and unscrambled in a similar encoder-decoder arrangement except that the decoding process is effectively reversed.

3,657,700

FORWARD ERROR CORRECTING SYSTEM

Lawrence Lutzker, Palo Alto, Calif., assignor to American Computer Communications Company, Inc.

Filed July 13, 1970, Ser. No. 54,505
Int. Cl. G08c *25/00;* **G06f** *11/00*
U.S. Cl. 340—146.1 **8 Claims**



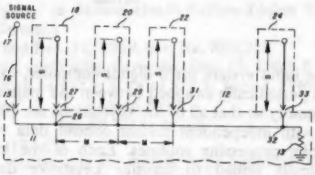
An adaptively coded forward error correcting data communications system having the capability of varying error correction potential without the necessity of variation in codes and without the necessity of increasing the percentage redundancy of transmitted data by adaptively varying the block length of the data transmitted utilizing varying data block lengths and in which more than a single block of data may be processed in over-lapping time relationship without full duplication of circuitry while permitting decoding and evaluation of the transmitted and received message.

3,657,701

DIGITAL DATA PROCESSING SYSTEM HAVING A SIGNAL DISTRIBUTION SYSTEM

Emory C. Garth, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 2, 1970, Ser. No. 86,014
Int. Cl. H05k *1/04*
U.S. Cl. 340—147 R **17 Claims**



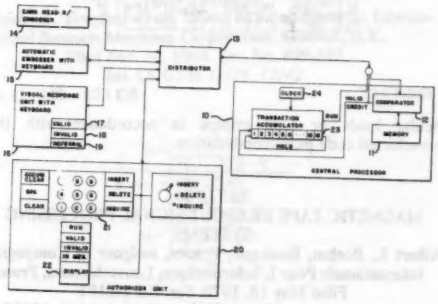
Logic signals are distributed to a plurality of logic cards in a digital computer. Each logic card taps into a motherboard transmission line with a conductor stub. Signal distribution on the motherboard is along a transmission line of a primary system impedance up to a first stub. At the first stub, signal distribution continues along a secondary impedance line of a suitable impedance such that signal discontinuities due to stubs and loads will be minimized. At a last stub signal distribution continues along a transmission line of the primary system impedance and is terminated in the primary impedance.

3,657,702

TRANSACTION ACCUMULATOR FOR A CREDIT VERIFICATION SYSTEM

Kenrick O. Stephenson, Jr., Upper Montclair, N.J., assignor to Digital Data Systems Corp.

Filed Aug. 19, 1970, Ser. No. 64,976
Int. Cl. G06k *5/00;* **H04g** *3/00*
U.S. Cl. 340—149 R **8 Claims**



In a system for verification of a customer's credit status in response to entry of a charge account number at a remote location, the level of credit sale activity is accumulated. Each time that a valid credit signal is sent to a remote location the accumulated level of credit sale activity is incremented. This accumulated level is compared to a predetermined run level. When it exceeds this level a run signal is sent to the point of sale to prevent completion of the sale. The accumulated credit sale activity is stored in sectors of a magnetic drum. The accumulation is periodically advanced from sector to sector. When the accumulation reaches the last sector it is timed out. In this way unusual credit card activity in a given period of time is determined. This activity is also compared to a hold level. If the activity exceeds the hold level the accumulation is inserted back into the first sector of the drum so that it is held in the accumulator for another period of time.

3,657,703

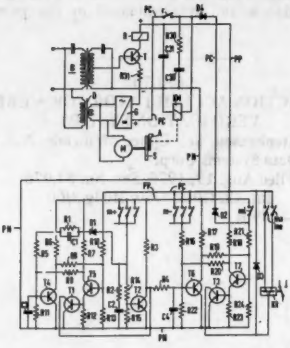
CODE-RESPONSIVE CONTROL RECEIVER

Hans-Wolfgang Steinlein, Nurnberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Mar. 10, 1971, Ser. No. 122,828
Claims priority, application Germany, Mar. 12, 1970, P 20 11 672.7
Int. Cl. H04q *9/00*
U.S. Cl. 340—167 R **5 Claims**

A code-responsive control receiver for response to preselectable code combinations, which operates on the pulse interval principle and has a synchronous selector and switching device for connecting a command relay to the pulse receiving circuit. The receiver is provided with a receiver relay responsive to the arriving preselector pulses and control pulses. A transistor flip flop circuit is connected to a direct voltage supply. The transistors of the flip flop cooperate with the switching members and through further

flip flop circuitry upon two differential coils of the command relay so that the system operates to selectively activate par-



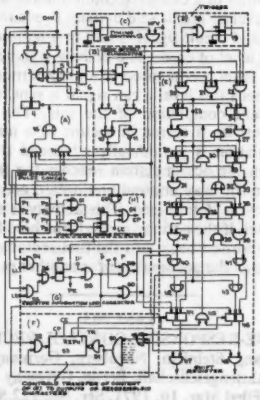
ticular loads or load groups in accordance with the preselected code pulse combination.

3,657,704

MAGNETIC TAPE READOUT SIGNAL PROCESSING SYSTEMS

Albert L. Boehm, Boulogne, France, assignor to Compagnie Internationale Pour L'Informatique, Louvechiennes, France

Filed May 18, 1970, Ser. No. 38,191
Claims priority, application France, June 3, 1969, 18202
Int. Cl. G11b 5/00
U.S. Cl. 340—172.5 **11 Claims**



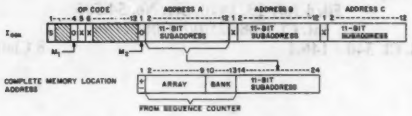
A system is provided for processing the signals read out from a phase modulated recorded magnetic tape. From each track of the tape are derived two distinct series of digital value significant pulses in which nonsignificant pulses appear. The system provides for elimination of such nonsignificant pulses and rearrangement of the remaining pulses for temporary registration in a plural stage assembly elementary register. It further provides for detection of various defects resulting from dynamic and magnetic skew and casual reconstitution of mutilated characters.

3,657,705

INSTRUCTION TRANSLATION CONTROL WITH EXTENDED ADDRESS PREFIX DECODING

John E. Mekota, Jr., Belmont; David M. Hudson, Holliston; Thomas G. Rankin, Harvard, and Jean E. Champagne, Wellesley, all of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 12, 1969, Ser. No. 875,902
Int. Cl. G06f 9/18
U.S. Cl. 340—172.5 **9 Claims**



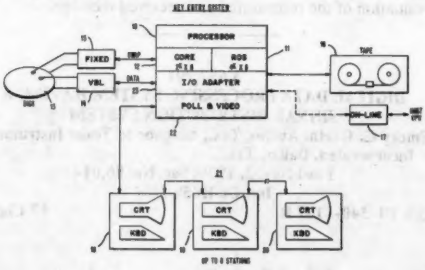
A special purpose prefix is defined which replaces the normal op-code field of an instruction, having the effect of translating that instruction from a normal instruction into an instruction with various formate extensions in addresses, indices and/or augments. The normal instruction addressing of the system has six basic formats which include: bank and subaddress coding; subaddress and index; indirect indexing; direct control addressing; indexed control addressing; indirect, indexed control addressing, and "inactive" addressing. All of the normal instructions may be extended with a special-purpose prefix.

3,657,706

KEYBOARD DIGITAL DATA ENTRY SYSTEM

Thomas B. Horgan, Wayland; Arthur W. Heineck, Wellesley, and Charles E. Newcomb, Acton, all of Mass., assignors to Inforex, Inc., Waltham, Mass.

Filed Nov. 12, 1969, Ser. No. 876,014
Int. Cl. G06f 3/02, 9/18
U.S. Cl. 340—172.5 **8 Claims**

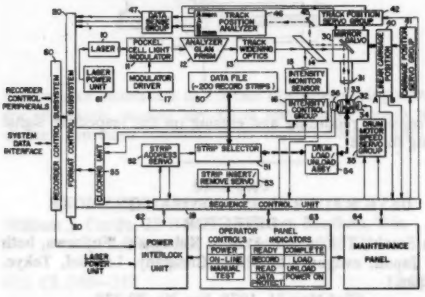


In an input system for a digital computer, format control data is periodically swapped between the magnetic disc unit and memory so that all of the keystations are effectively provided with independent format control data while sharing keystroke processing routines. Each of the keystations is periodically polled to transfer keystroke data into the memory while display devices at each keystation are enable in synchronism with the keystroke polling so that data for each keystation can be transmitted over a single data transmission channel connecting the memory to all of the data display devices. A single-bit latch controls whether the next installation to be executed is fetched from a fixed memory or from a read-write memory.

3,657,707
LASER RECORDING SYSTEM WITH BOTH SURFACE DEFECT AND DATA ERROR CHECKING

Keith E. McFarland, Woodside; Carl H. Becker; Harold R. Dell, both of Palo Alto; Masao Hashiguchi, Mount View; Edward D. Lara, Cupertino, and Herman Wong, Santa Clara, all of Calif., assignors to Precision Instrument Company, Palo Alto, Calif.

Filed Mar. 17, 1969, Ser. No. 807,548
Int. Cl. G11c *13/04, 29/00*
U.S. Cl. 340—173 LM **16 Claims**



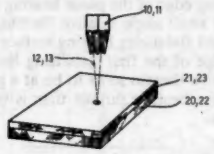
A laser data recording system for storing digital information in the form of digital bits ablated from an energy-absorbing storage medium by an intensity modulated laser beam. The system provides instantaneous reflective readout of the local surface state of the storage medium as the ablative recording process is initiated at selected locations along a scan line, in response to the intensity of the modulated laser beam. This reflective readout simultaneously provides a recording surface continuity verification signal which is monitored to insure that the storage medium surface is free from defects at the point of recording. The proper sequence of levels of this instantaneous reflective signal verifies that the portions of the data record which are to be ablated are actually generated, and that the regions which are not to be ablated are void-free, thus insuring a completely correct recording. The laser beam is scanned in parallel scan lines across the storage surface and during read-out of stored information the intensity of the laser beam is set at a fixed level sufficiently low that ablation cannot occur. Signals are also provided for automatically centering the laser beam on selected scan line and for servo control of laser intensity. In one embodiment removable and replaceable recording strips are mounted around the surface of the drum. A rectangular cross-section is optically imparted to the laser beam.

3,657,708
ELECTRONIC STORAGE APPARATUS

Walter Kroy, and Walter E. Mehnert, both of Munich, Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Postfach, Germany

Filed Dec. 11, 1969, Ser. No. 884,213
Claims priority, application Germany, Dec. 13, 1968, P 18 14 529.4; P 18 14 527.2; P 18 14 528.3; June 4, 1969, P 19 28 549.5
Int. Cl. G11c *11/26*
U.S. Cl. 340—173 CR **12 Claims**

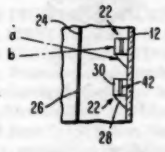
Electronic storage unit for storing large quantities of data in a small space. A first suitably coated metal plate cooperates with a first electron beam for recording data, said first beam being controlled through a suitable address unit, switching unit and control device, together with an amplifier for compensating for losses in the strength of recorded data. A second electron beam system is provided for reading out data, said second beam system being provided with a second suitably coated metal plate and is subjected to the control of said address unit. The second electron beam system acts through a further amplifier and switching unit to the device, as a computer, being controlled.



3,657,709
STORAGE TUBE WITH POINTWISE ERASE CAPABILITY

Russell W. Dreyfus, Cross River, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,107
Int. Cl. G11c *11/26, 11/42*
U.S. Cl. 340—173 CR **20 Claims**

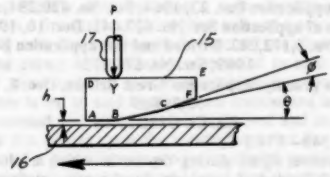


A beam addressable display and storage tube having pointwise erase capability. Each localized storage element has associated therewith an erase element which is energized by a writing beam or another beam to provide output energy for erasing the information contained in the associated storage element. In addition to storage and display, memory applications exist. Any beam addressable storage element can be used including those which form color centers or which have their color centers altered upon impact of a beam of energy.

3,657,710
MULTIPLE SURFACE FLUID FILM BEARING

Shahbuddin A. Billawala, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of application Ser. No. 868,502, Oct. 22, 1969, now abandoned. This application Jan. 13, 1971, Ser. No. 106,294
Int. Cl. G11b *5/60, 21/20*
U.S. Cl. 340—174.1 E **14 Claims**



A fluid film bearing particularly suitable for the magnetic recording head of a rotating disk magnetic memory is described. The head has a bearing surface which is adapted to float in very close proximity to a magnetic memory surface moving at a relatively high velocity. The relative velocities

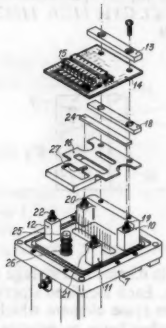
are such that a stable film of air, a few tens of micro-inches thick, separates the recording head from the memory element. A conventional stabilizing bearing surface is provided along the leading edge of the plane bearing surface and angulated at a very small angle relative thereto. In the improved bearing a second stabilizing bearing surface is disposed along the leading edge of the first stabilizing bearing surface and angulated relative thereto so as to be at a greater angle relative to the plane bearing surface than is the first stabilizing bearing surface.

3,657,711

MULTIPLE HEAD UNIT FOR MAGNETIC DISC MEMORY

Gilbert A. Thiaffey-Rencorel, Saint-Michel Sur Orge, France, assignor to Societe D'Applications Generales D'Electricite et de Mecanique, Paris, France

Filed July 10, 1970, Ser. No. 53,809
Claims priority, application France, July 15, 1969, 6924090
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1 E **1 Claim**



Magnetic multiple head unit for a magnetic disc memory store. The head unit comprises a shoe on which are mounted two parallel staggered rows of mutually equi-spaced recording and reading heads and a blade spring mounting for said shoe enabling it to float close to the surface of the magnetic disc. The blade spring is rectangular, and is fixed along one side to a cross piece thereof and contains two windows defining a framework itself defining and end-notched crosspiece connected to the frame work on which the shoe is mounted.

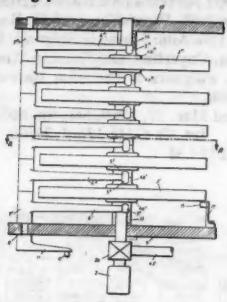
3,657,712

STORING DEVICE FOR SIGNALS

Gerhard Dirks, Los Altos Hills, Calif., assignor to Dirks Computer Systems Corporation, Los Altos Hills, Calif.

Original application Dec. 22, 1964, Ser. No. 420,294, which is a division of application Ser. No. 627,441, Dec. 10, 1956, now Patent No. 3,172,082. Divided and this application Nov. 14, 1969, Ser. No. 876,872
Claims priority, application Great Britain, Dec. 8, 1955, 35,358/55
Int. Cl. G11b *25/04*
U.S. Cl. 340—174.1 C **6 Claims**

A selective signal storing device in which a plurality of discs each having at least one signal storing surface at one face thereof are mounted about a common axis, and in which a plurality of transducer means are coupled together to move simultaneously in a direction transverse to said axis into a position to respectively cooperate with a selected track on the signal storing surface of corresponding discs. The device includes further drive means operable for effecting relative movement between the discs and the transducer means, and means to cause at least a selected one of the transducer means at least during part of such relative movement to effect sensing, recording and erasing on the respective signal storing surface.

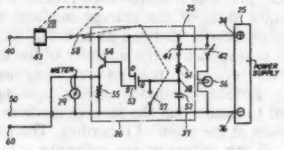


3,657,713

DEVICE FOR TESTING IONIZATION SMOKE DETECTOR

Koju Sasaki, Tokyo, and Akihiro Kobayaski, Fujisawa, both of Japan, assignors to Nittan Company, Limited, Tokyo, Japan

Filed May 21, 1970, Ser. No. 39,329
Claims priority, application Japan, June 2, 1969, 44/4256; 44/75975; Sept. 11, 1969, 44/71586; 44/78974
Int. Cl. G08b *17/10*
U.S. Cl. 340—214 **3 Claims**



A testing device for an ionization smoke detector having series connected opened and closed ionization chambers and means for detecting a change of impedance of the open chamber wherein means are employed to generate a variable voltage which is applied to the open ionization chamber to produce a change in voltage across the ionization chamber corresponding to that produced by a change in smoke concentration and means for interrupting the variation in voltage immediately upon operation of the detector to determine the sensitivity of the detector to the presence of smoke.

3,657,714

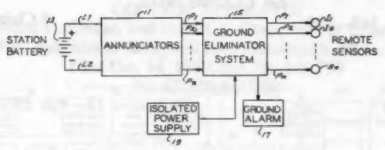
GROUND ELIMINATOR SYSTEM

Arthur R. Kessler, St Louis, Mo., assignor to Electro Devices, Inc., St. Louis, Mo.

Filed June 10, 1970, Ser. No. 45,018
Int. Cl. 340 *409;* **G08b** *21/00*
U.S. Cl. 340—255 **21 Claims**

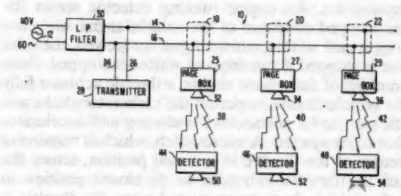
Apparatus for use in an annunciator system wherein the system includes a plurality of remote sensors for detecting out-of-limit conditions and a central annunciator station with a plurality of alarm annunciator means for continuously monitoring the respective sensors and for giving an alarm indication in response to detection of an out-of-limit condition by the respective sensors, the sensors each being interconnected with the respective annunciator means by respective sensor leads which are subject to undesirable grounding. The apparatus includes means, constituted by relay circuitry, for detecting the grounding of an unidentified one of the sensor

leads. A stepping switch constitutes means for scanning respective sensor leads for the presence of a grounded condition, and circuitry interconnected with the respective alarm



annunciator means acts as a means operative during scanning for selectively causing any alarm annunciator means to indicate a grounded condition of its respective sensor lead.

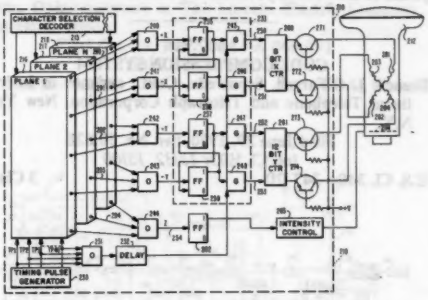
3,657,715
ULTRASONIC PAGING SYSTEM
William J. Curtin, 25 West Main Street, Madison, Wis.
Filed Apr. 13, 1970, Ser. No. 27,750
Int. Cl. G08b *1/02*
U.S. Cl. 340—311 **12 Claims**



A system for paging or calling persons without disturbing anyone other than the person or persons being paged. A transmitter applies an electrical signal to a power line at a predetermined ultrasonic frequency indicative of the person sought. The power line is connected to a plurality of power outlets into which are plugged transducers which convert the electrical signal into an ultrasonic signal at the same frequency. The ultrasonic signal is broadcast from a speaker at each transducer and detected by the person carrying an ultrasonic detector responsive to that frequency.

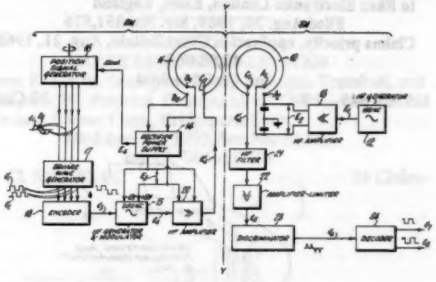
3,657,716
CHARACTER GENERATOR FOR CATHODE RAY TUBE DISPLAY DEVICE
Louis E. Ambrico, Hyde Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 15, 1970, Ser. No. 45,964
Int. Cl. G06f *3/14*
U.S. Cl. 340—324 A **5 Claims**

A character generator for a cathode ray tube display device generates X and Y deflection potentials and intensity control signals for the cathode ray tube by utilizing a separate storage matrix for each character with the storage elements in each such matrix being disposed where, and only where, a change is required in the direction of the X deflection, a change in the direction of the Y deflection, or a change in the intensity control signal, thereby to reduce the number of storage elements required in the storage matrices for the characters. Control signals from a selected storage matrix operate bistable storage devices which in turn operate gates to supply timing pulses to an up-down X counter and an up-down Y counter which count in either direction and convert digital quantities to analogue quantities thereby to



control the vertical and horizontal deflection of the electron beam of the cathode ray tube to generate a character.

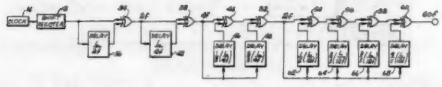
3,657,717
SYSTEM OF DIGITAL MEASUREMENT OF THE POSITION OF A FIRST MEMBER SLIDABLY MOUNTED UPON A SECOND ROTATING MEMBER
Fritz Glantschnig, Neuenhof, and Manfred Tiesnes, Nussbaumen, both of Switzerland, assignors to Patelhold Patentverwertungs- & Elektro-Holding AG, Glarus, Switzerland
Filed June 5, 1970, Ser. No. 43,844
Claims priority, application Switzerland, June 6, 1969, 8636/69
Int. Cl. G08c *9/04*; H03k *13/00*
U.S. Cl. 340—347 SY **9 Claims**



A system of digital measurement of the position of a first member slidably mounted upon a second rotating member comprises a first stationary coupling coil and a second similar coupling coil mounted upon the second member coaxially with the rotary axis thereof and parallel to said first coil. Energy produced by a stationary high frequency power generator is fed to said first coil and transmitted inductively to the second coil from which it is derived and rectified, to provide d.c. power upon the rotating member for the energization of a pulse former producing digital position signals proportional to the movement of said first member and of a high-frequency signal generator modulated by said position signals. The output energy of the signal generator is transmitted inductively via said coils in a direction opposite to the transmitting direction of the power energy and the signal energy derived from the first coupling coil demodulated, to retrieve the original position signals for application to a translating device. In order to effect full decoupling between

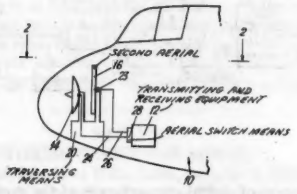
the power and signalling circuits, the power energy is transmitted in symmetrically balanced relation and the signal energy is transmitted in unbalanced relation to the center points of the coils as potential reference.

3,657,718
CODE COMPRESSION SYSTEM
Francis J. O'Farrell, Sepulveda, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed June 29, 1970, Ser. No. 50,628
Int. Cl. H03r *13/32*, *13/00*
U.S. Cl. 340—347 DD 3 Claims



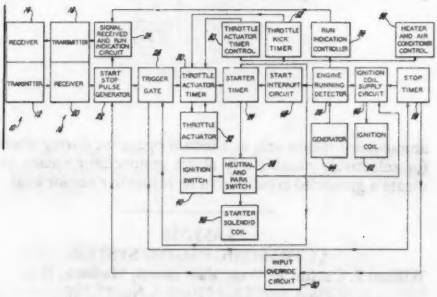
A code compression system comprises a generator for producing a maximal length sequence code at a first predetermined frequency. The code is delayed with respect to the generated code, and both codes are then combined to produce an output code having an identical maximal length sequence code as the generated code, at a higher multiple frequency than the generated code. The circuit for combining the generated code and the delayed code may comprise an exclusive OR gate.

3,657,719
AIRBORNE PULSED RANGE FINDING RADAR
David Rooksby Bollard, North Cambridge, and William Alfred Jenkins, Westcliff-on-Sea, both of England, assignors to Ekco Electronics Limited, Essex, England
Filed Aug. 20, 1969, Ser. No. 851,576
Claims priority, application Great Britain, Aug. 21, 1968, 40,084/68
Int. Cl. G01s *9/04*
U.S. Cl. 343—7 TA 12 Claims



An airborne pulsed range-finding radar adapted for use in an aircraft and suitable for terrain range finding by a downwardly inclined radar beam, comprises means to apply to a voltage storage device for successive short periods a derived voltage derived from and dependent upon a detected received video echo signal, means to produce an integrated difference voltage by integrating the difference between the derived voltage and a stored voltage in said voltage storage device when said derived voltage is the greater, control means operable to initiate each said short period at a time having a relation to the time of commencement of each transmitted radar pulse determined by the instantaneous magnitude of the integrated difference voltage, and means to utilize the integrated difference voltage as an indication of range.

3,657,720
REMOTE ENGINE START AND STOP SYSTEM
Anatol Avdenko, Rochester, and Bruce C. Erway, Honeoye Falls, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.
Filed June 1, 1970, Ser. No. 41,872
Int. Cl. G08c *19/32*
U.S. Cl. 343—225 5 Claims



A remote engine start and stop system for remotely starting and stopping a vehicle engine by a pair of single channel radio transceivers. An engine running detector senses the started or stopped condition of the vehicle engine and controls a trigger gate so that, when a signal is received, the vehicle engine is stopped if running and started if stopped. Prior to the cranking of the vehicle engine, a throttle actuator fully opens the vehicle throttle to permit the carburetor choke and a fast idle cam to be positioned for starting and accelerator pump shot to be ejected. A microswitch, which is responsive to the return of the throttle to a closed position, senses the failure of the throttle to return to its closed position to prevent the vehicle from being started when the throttle is stuck. In addition, an input override circuit prevents a signal from starting the vehicle engine during the time period when the vehicle engine is being stopped so as to prevent the clashing of the starter gears.

3,657,721
RECORDING TAPE WITH PARTIALLY OXIDIZED ALUMINUM FILM
Eberhard Traub; Alfred Ortlieb; Klaus Brill, and Wolfgang Grothe, all of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Sept. 9, 1970, Ser. No. 70,679
Claims priority, application Germany, Sept. 11, 1969, P 19 45 939.3
Int. Cl. G01d *15/34*
U.S. Cl. 346—135 6 Claims

This invention is concerned with a recording tape in which the information becomes visible as a result of burning away a trace from a metallic film deposited on the carrier. The metallic film consists of metallic aluminum containing imbedded therein quantities of aluminum oxide and aluminum oxyhydrate. The presence of the oxide and the oxyhydrate decreases both the required writing pressure and the voltage necessary for producing a current sufficiently high to burn away the metallic layer.

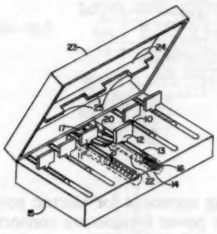
ERRATA

For Classes 200—42 thru 343—12 R see: Patent Nos. 3,657,722 thru 3,657,738

3,657,722
CONTROL APPARATUS

Richard C. Givens, and Robert A. Glass, both of Clearwater, Fla., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 14, 1969, Ser. No. 866,799
Int. Cl. H01h 27/00
U.S. Cl. 200—42 7 Claims

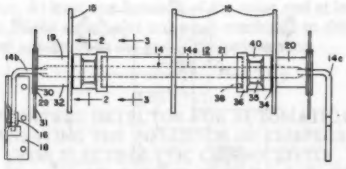


A signal actuator module having a set of spring loaded levers which can be in one of at least two operating positions is disclosed. The various positions of the levers in the set represents a code. The module is for mounting on other equipment such as a signal transmitter which contains cooperating switches. The switches are operated by magnetic or mechanical means attached to the levers and movable therewith. The module is completely enclosed by a cover which when opened permits all of the levers to return to the same position thereby preventing discovery of the code.

3,657,723
SEGMENTED INSULATOR FOR CONTACT BLADE DRIVE BAR OF A MANUAL SWITCH

Tadeusz J. Rys, Lexington, Ky., assignor to Square D Company, Park Ridge, Ill.

Filed Apr. 9, 1970, Ser. No. 26,917
Int. Cl. H01h 9/00
U.S. Cl. 200—166 A 9 Claims

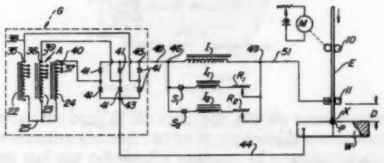


The insulator comprises three molded segments which are mounted in interlocked end-to-end relation along the drive bar. The two end segments are of fixed length, and the intermediate segment is selectable in length depending upon the length of the drive bar which in turn depends upon the width of the switch. The segments are generally U-shaped in transverse cross-section, and are held in position on the drive bar by a flexible strip of insulating material inserted between spaced shoulders on the end segments after the segments are placed on drive bar. Arc shields may be secured to either or both of the end segments.

3,657,724
METHOD OF AND POWER SUPPLY FOR ELECTRIC ARC WELDING

Albert G. Feeley, and George G. Landis, both of Chagrin Falls, Ohio, assignors to The Lincoln Electric Company, Cleveland, Ohio

Filed Oct. 24, 1969, Ser. No. 869,091
Int. Cl. B23k 9/10
U.S. Cl. 219—131 R 13 Claims



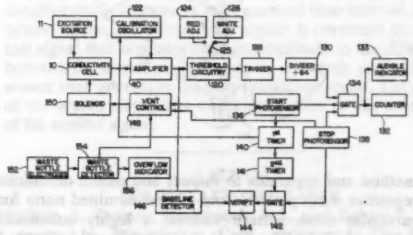
Electric power supply for arc welding of the drop transfer type with a small diameter electrode which changes its dynamic characteristics when the drop short circuits the electrode to the weld pool. The supply is a DC power source having a short circuit current rate of rise greater than 100,000 amperes per second in series with an inductive choke which substantially reduces the rate of rise.

Two circuits, each including a generally low resistance and/or low inductance and each including an appropriately polarized diode, are each in electrical parallel with the inductive choke. One circuit functions to increase the short circuit current rate of rise when the drop contacts the weld pool and the current starts to rise. The other absorbs the inductive energy in the choke when the short is broken and the current starts to decrease.

3,657,725
PARTICLE COUNTING SYSTEM

Weems E. Estelle, Southport; Henry R. Angel, Trumbull, and Pasquale M. Petrucci, Orange, all of Conn., assignors to General Science Corp., Bridgeport, Conn.

Filed Apr. 28, 1970, Ser. No. 32,582
Int. Cl. G06m 11/04
U.S. Cl. 235—92 PC 24 Claims

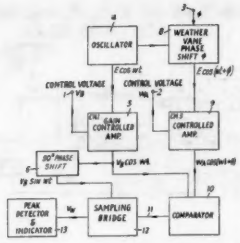


A particle counting system especially adapted for blood cell counting and which is essentially automatic in operation. The system includes an easily replaceable conductivity cell and electro-optical metering of a predetermined volume of sample fluid and also includes calibration and self-checking circuitry to enable reliable and accurate analysis.

3,657,726
FUNCTION EVALUATING APPARATUS

Michael Etherington, San Mateo, Calif., assignor to Electric & Musical Industries Limited, Hayes, Middlesex, England

Filed Dec. 19, 1969, Ser. No. 886,557
Claims priority, application Great Britain, Dec. 19, 1968, 60,277/68
Int. Cl. G06g 7/78, 7/22
U.S. Cl. 235—150.2 4 Claims

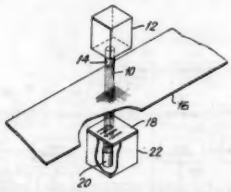


Apparatus for evaluating a first function of a variable, the variable being determined by the solution of an equation represented by the equality of two other functions of the variable, includes means which produce a first electrical signal which oscillates so as to periodically set up successive representations of the first function for different values of the variable, and means which produce two further electrical signals which oscillate so as to periodically set up successive representations of the two other functions for corresponding values of the variable. Instants of equality of the two further electrical signals are detected and the first electrical signal is sampled at such instants for evaluating the first function of the variable. Such apparatus adapted for evaluating the speed of a yacht to windward or downwind is disclosed.

3,657,727
METHOD AND APPARATUS FOR DETECTING FLAWS IN A FABRIC WEB BY COMPARING THE WEB DIFFRACTION PATTERN WITH A STANDARD MASK

Maurice E. Blevins, Spartanburg, S.C.

Filed Mar. 10, 1970, Ser. No. 18,196
Int. Cl. G01n 21/30
U.S. Cl. 250—219 WE 11 Claims

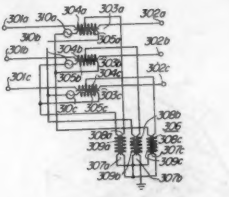


A method and apparatus to inspect and detect deviations in a repetitive mesh pattern from a predetermined norm for the particular mesh pattern wherein a highly collimated monochromatic light beam, such as a laser beam, is directed to pass through the mesh pattern, such as a woven or knitted fabric, is diffracted by the mesh pattern, and the diffracted laser pattern is directed onto a mask which is indicative of a norm for the mesh pattern. A light-detecting apparatus, such as a photocell, is placed beyond the mask and any deviation in the mesh of the fabric from a predetermined norm for that particular fabric results in a deviation of the diffracted pattern of the laser beam through the mask which affects, and is detected by, the photocell.

3,657,728
INTERCONNECTING APPARATUS WITH IMPEDANCE INSERTION MEANS FOR ELECTRIC POWER SYSTEMS

Tsuneo Mitsui, Tokyo; Keizo Nakayam, Hitachi-shi; Tetsuo Kobayashi, Mito-shi, and Kenzo Okuda, Hitachi-shi, all of Japan, assignors to The Tokyo Electric Power Co., Inc. and Hitachi, Ltd., Tokyo, Japan

Filed Aug. 7, 1969, Ser. No. 848,314
Claims priority, application Japan, Aug. 14, 1968, 43/57330
Int. Cl. H02j 1/10
U.S. Cl. 307—20 10 Claims

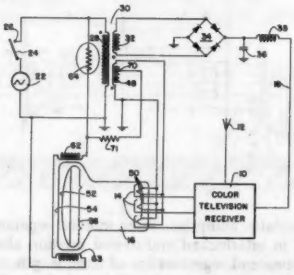


An interconnecting apparatus for electric power systems wherein two electric power systems are connected to each other with a series transformer and the secondary winding of the series transformer is energized with a compensating voltage whose value and polarity are such that it cancels the voltage drop developed across said transformer when said electric power systems are normally operating. The compensating voltage is derived from the secondary winding of an exciting transformer inserted between the central point of the series transformer and the earth. The secondary winding of the series transformer is connected in delta and the secondary winding of the exciting transformer is star-connected. If it is necessary, the exciting transformer may be provided with a tertiary winding to control the voltages of the respective power systems by the voltage of this tertiary winding.

3,657,729
DEGAUSSING CIRCUIT WITH BUCKING CURRENT SOURCE FOR REDUCING CURRENT IN DEGAUSSING COIL TO ZERO

Robert B. Hansen, Arlington Heights, and William H. Slavik, Oak Lawn, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed May 6, 1970, Ser. No. 34,985
Int. Cl. H01j 31/20; H01f 13/00
U.S. Cl. 315—8 3 Claims



A degaussing circuit used in a color television receiver includes a positive temperature coefficient resistor connected in series with the degassing coil, and in addition includes a circuit coupled with the filament winding of the receiver for applying a current through the coil in phase opposition to the

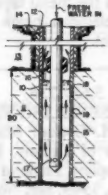
current through the positive temperature coefficient resistor. The opposition current is of a magnitude equal to the residual current through the positive temperature coefficient resistor to reduce the current in the degaussing coil to zero after the degaussing operation is complete.

3,657,730

METHOD FOR DETERMINING RESIDUAL HYDROCARBONS PRESENT IN A SUBTERRANEAN EARTH FORMATION

Joseph D. Robinson, Houston, Tex.; Jay D. Loren, New Orleans, La., and William T. Higdon, Lamoni, Iowa, assignors to Shell Oil Company, New York, N.Y.

Filed Jan. 14, 1970, Ser. No. 2,712
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **12 Claims**



A method for determining residual hydrocarbons present in a subterranean earth formation by quantitatively determining the amplitude of the proton free-precession signal that is due to the protons contained in the residual hydrocarbons that are present in an interval of the subterranean hydrocarbon-bearing earth formation. The mud cake is removed or made permeable along a section of a well borehole adjacent the interval to be tested. An aqueous solution is injected down the well borehole and into the interval to be tested until the injected fluid occupies substantially all of the space within the well borehole and the interval to be tested that was previously occupied by other aqueous liquids in a zone extending into the interval to be tested at least substantially as deeply as a nuclear magnetism measuring device is to be responsive to proton free-precession signals. The solution which is injected contains sufficient dissolved paramagnetic material to provide a water phase nuclear magnetism thermal relaxation time that is too short to be responded to by the nuclear magnetism measuring device. A nuclear magnetism measuring device is disposed within the well borehole adjacent the interval to be tested and measurements are made of the responses with time of the device to (a) noise in the absence of polarization and (b) proton free-precession signal plus noise. At least one function of the noise and at least one function of the signal plus noise are combined to determine the signal amplitude at the end of the polarization.

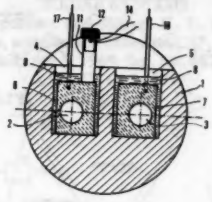
3,657,731

TEMPERATURE DETECTOR FOR AUTOMATICALLY COMPENSATING THE INFLUENCE OF TEMPERATURE UPON ELECTROLYTIC CONDUCTIVITY

Werner Krauer; Alfred Martinelli, both of Zurich, and Friedrich Oehme, Bassersdorf, all of Switzerland, assignors to Polymetron Ltd., Glattbrugg, Switzerland

Filed Nov. 17, 1969, Ser. No. 877,297
Claims priority, application Switzerland, Apr. 24, 1969, 6237/69
Int. Cl. G01n *27/42*
U.S. Cl. 324—30 R **19 Claims**

A temperature detector for a conductivity-measuring cell having a heat-sensitive element which has electrical properties that very in accordance with temperature. The heat-sensitive element is inserted in a bore of an electrode of the conductivity-measuring cell and is not in direct contact with the sample liquid. A metal beaker is first inserted in the electrode, preferably made of graphite, and a small diameter metal tube with a cap is located above the metal beaker. A high thermal conductivity paste is inserted in the space



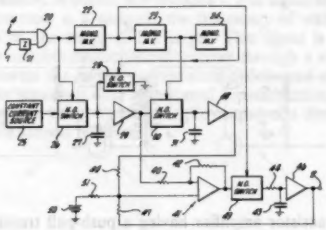
between the bore of the electrode and the metal beaker. The heat-sensitive element can be in the form of a removable cartridge and can consist, for example, of a semiconductor or a platinum resistance thermometer.

3,657,732

PHASE SYNCHRONIZING SYSTEM

Peter L. Krause, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of application Ser. No. 780,160, Nov. 29, 1968, now abandoned. This application Mar. 9, 1971, Ser. No. 122,544
Int. Cl. H03k *5/18*
U.S. Cl. 328—155 **17 Claims**



A source of periodic controlled signals is synchronized to periodic reference signal by sensing the time interval between given points of the controlled signal and the reference signal during each cycle and correcting the source simultaneously responsive to the sensed time interval in successive cycles. Specifically, the source is corrected by a control signal that is proportional in amplitude to the difference between the sensed time interval in one cycle and twice the sensed time interval in the next subsequent cycle. The period of the source changes in direct proportion to the amplitude of the control signal.

3,657,733

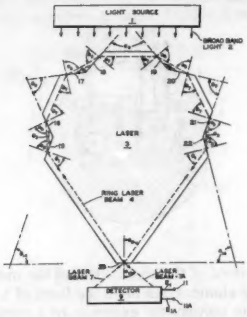
SOLID STATE RING LASER

William A. Shapiro, Hackensack, N.J., and Robert P. Kemmerer, Jr., Bloomington, Calif., assignors to The Bendix Corporation

Filed Aug. 25, 1969, Ser. No. 852,708
Int. Cl. H01s *3/02, 3/05*
U.S. Cl. 330—4.3 **2 Claims**

A solid state one-piece ring laser having a plurality of surfaces for converting broad band light to a ring laser beam. At least one surface is refractive and is arranged at a Brewster's angle to the ring laser beam to linearly polarize the ring laser beam. Some of the surfaces may be reflective and are ar-

ranged at critical angles to the ring laser beam. With this arrangement, none of the surfaces needs to be coated with a



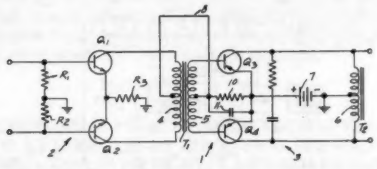
dielectric which deteriorates with age and environment. In a preferred arrangement, as many of the surfaces as possible are refractive to provide a more coherent laser beam.

3,657,734

AUDIO POWER AMPLIFIER

Daniel L. Queen, Chicago, Ill., assignor to Chamberlain Manufacturing Corporation, Waterloo, Iowa

Filed Oct. 31, 1969, Ser. No. 873,005
Int. Cl. H03f 3/26
U.S. Cl. 330—15 **3 Claims**



A transistor amplifier having a push-pull transistor driver stage and a push-pull transistor output stage operatively coupled thereto in which the transistors of the driver stage are biased for class B operation and the transistors of the output stage are biased to approximately collector current cutoff when in a quiescent condition generally corresponding to class B operation, the collector current of the driver stage, in the presence of a signal, being utilized to derive a bias voltage applied to the transistors of the output stage as a forward bias, whereby collector current in such stage flows substantially continuously during a complete electrical cycle of such signal, corresponding to class A operation.

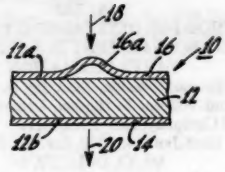
3,657,735

ELECTRON BEAM EXCITED LASER

Frederick Hermes Nicoll, Princeton, N.J., assignor to RCA Corporation

Filed Mar. 20, 1970, Ser. No. 21,292
Int. Cl. H01s 3/05, 3/09, 3/18
U.S. Cl. 331—94.5 **7 Claims**

An electron beam excited laser element including a body of a material which is capable of generating light when excited by an electron beam and having a pair of opposed, substantially parallel, spaced surfaces. A partially reflective layer is provided on one surface of the body to allow emission of a portion of the light from the body. A metal layer is provided over the other surface of the body with at least a portion of the metal layer being spaced from the surface of the body. The metal layer is substantially fully light reflective but transmits the electrons of the electron beam with little loss. When an electron beam is directed at the spaced portions of the metal film, the material of the body is excited to



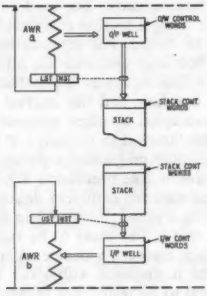
generate light which is emitted through the partially reflective layer. The spacing of the metal layer from the surface of the body reduces the electron beam power necessary to cause lasing of the element.

3,657,736

METHOD OF ASSEMBLING SUBROUTINES

Roger J. Boom; John M. Cotton; Martin J. Goodier, and David C. Cosserat, all of Taplow, England, assignors to Plessey Btr Limited, Taplow, England

Filed Dec. 22, 1969, Ser. No. 887,144
Claims priority, application Great Britain, Jan. 2, 1969, 193/69
Int. Cl. G06f 9/00
U.S. Cl. 340—172.5 **4 Claims**



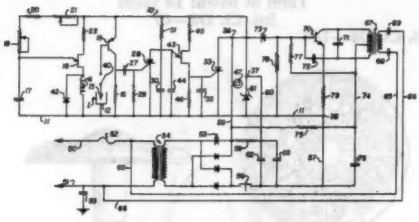
The invention relates to data processing systems and particularly to intercommunication arrangements for use in multiprocessor systems of the distributed algorithm type. In such systems each programme routine is provided with at least one input data area (input well) and at least one output data area (output well) each routine being arranged to process a block of data (input data packet) in an input well and to produce a processed block of data (output data packet) in an output well. Additionally common data areas (queues) are provided arranged to temporarily store related data packets on a first-in first-out basis. The processor input-output instructions are used to provide automatically activated arrangements to transfer a data packet from a relevant queue to a particular routine related input well immediately prior to the commencement of a programme routine and to transfer the processed data pocket to a relevent queue from an output well immediately after the completion of the routine regardless of the relative locations of the co-operating wells and queues. The provision of input and output wells allows for the use of self-contained programme-routines while the provision of queues between routines allows for the asynchronous performance of those routines.

3,657,737

METHOD OF AND DEVICE FOR SMOKE DETECTION AND CIRCUITS THEREFOR

Jeffrey E. Hamm, 1062 South Decatur Street, Denver, Colo., and Harley E. Watkins, 14425 Garden Road, Golden, Colo.

Filed Dec. 29, 1969, Ser. No. 888,281
Int. Cl. G08b 21/00
U.S. Cl. 340—237 S 10 Claims



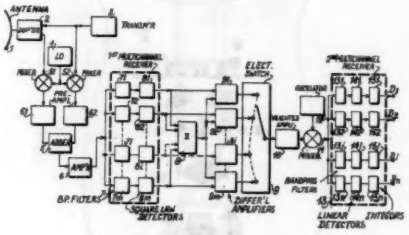
A smoke detection method and device in which a momentary charging pulse, such as of one-tenth second duration, is intermittently imposed on an ionization chamber, such as once every second to once every 3 seconds. A resistor-capacitor timer coupled with a unijunction transistor produces the momentary, intermittent pulses which are transferred to the chamber through a field effect transistor or a reed relay switch. The current through the ionization chamber triggers a transistor when clear air or no smoke is present, but fails to trigger the transistor when smoke or other types of particles are present. A continuously charging capacitor is discharged when the above transistor fires, but is permitted to become fully charged when the above transistor is not fired. This triggers another unijunction transistor which produces a signal for lighting a lamp, etc. An oscillator produces a different frequency than the a.c. supply line and is coupled therewith to superimpose the oscillations on the supply line, the oscillator stopping when the above signal is produced. A receiver may be plugged into the supply line and receive signals of different frequencies from detectors at different locations, in order to trigger an audible alarm and indicate which detector has detected smoke.

3,657,738

RADAR SYSTEMS

Michel F. Carpentier, and Robert G. L. Guilhem, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 5, 1969, Ser. No. 882,469
Int. Cl. G01s 9/04
U.S. Cl. 343—12 R 11 Claims



A radar system referred to as a noise radar system operating in a continuous or quasi-continuous mode, which transmits a noise signal toward a target. The receiver signal from the target is summed up with a replica of the transmitted signal and the composite signal obtained is processed in a first multichannel receiver wherein it is directed in a preferred manner, to square law detectors. The signal issuing from the detectors is a sinusoid the frequency of which is proportional to the range of the target. This signal is then processed in another multichannel receiver through a switch which transforms the spatial representation delivered at the output of the detectors into a temporal representation, the range information being obtained at the output of a distance channel of the second receiver.

DESIGNS

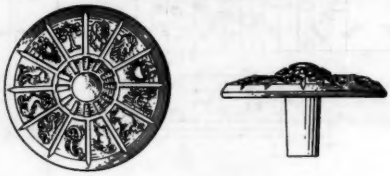
APRIL 18, 1972

223,430
DRESS OR LIKE GARMENT
Doris Brosk, 150 E. 16th St., New York, N.Y. 10021
Filed Apr. 13, 1970, Ser. No. 22,388
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—81

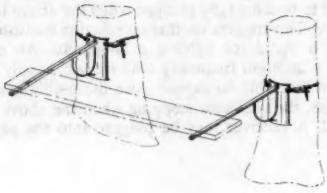
223,431
ELECTRIC CONTROL KEY
Dan C. Muessel, Stamford, Conn., and William Eisenreich, White Plains, N.Y., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Dec. 9, 1970, Ser. No. 26,367
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—136

223,432
ELECTRICAL KEY
William Eisenreich, White Plains, N.Y., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Dec. 9, 1970, Ser. No. 26,381
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—136

223,433
KNOB
George F. Miller, Monterey Park, and Ray Tintary, Covina, Calif., assignors to Ajax Hardware Manufacturing Corp., City of Industry, Calif.
Filed Sept. 18, 1970, Ser. No. 25,055
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—144

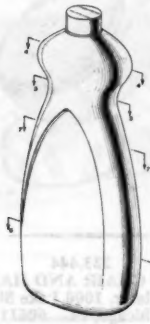


223,434
TREE BRACKET
William H. Dailey, 18175 SW. Kinniman Road, Aloha, Oreg. 97006
Filed June 17, 1970, Ser. No. 23,534
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—234



223,435
RETAINING CLIP FOR AN INFORMATION CARRYING MEMBER OR SIMILAR ARTICLE
Arthur Walter Hood, Benfleet, England, assignor to Falconcraft (Aluminium) Limited, Romford, England
Filed Apr. 29, 1970, Ser. No. 22,702
Claims priority, application Great Britain Nov. 5, 1969
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—259

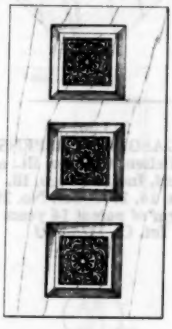
223,436
BOTTLE
David G. Hills, Collinsville, Conn., assignor to Monsanto Company, St. Louis, Mo.
Original design application Oct. 28, 1968, Ser. No. 14,188, now Patent No. 220,611. Divided and this application Mar. 17, 1970, Ser. No. 22,225
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117



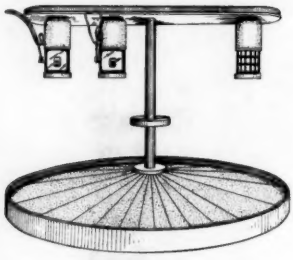
223,437
COMBINED BOTTLE AND CLOSURE THEREFOR
Alberto Parera Lluch, Barcelona, Spain, assignor to Perfumeria Parera, S.A., Barcelona, Spain
Filed May 28, 1970, Ser. No. 23,189
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131

223,438
COMBINED BOTTLE AND CLOSURE THEREFOR
Alberto Parera Lluch, Barcelona, Spain, assignor to Perfumeria Parera, S.A., Barcelona, Spain
Filed May 28, 1970, Ser. No. 23,188
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—169

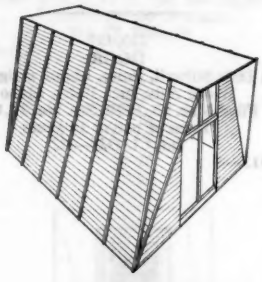
223,439
DOOR
Melvyn Dale Stilwell, Boise, Idaho, assignor to Old World Arts, Inc., Boise, Idaho
Filed Mar. 30, 1970, Ser. No. 22,114
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1



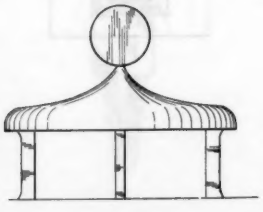
223,440
GASOLINE SERVICE STATION ISLAND CANOPY WITH ANNULAR LIGHT FIXTURE
Eliot F. Noyes, New Canaan, Conn., assignor to Mobil Oil Corporation
Filed July 15, 1970, Ser. No. 23,948
Term of patent 14 years
Int. Cl. D25—*99*; D26—*03*
U.S. Cl. D13—1



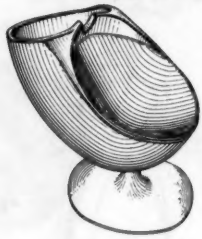
223,441
BUILDING
John E. Holt, P.O. Box 264, South Laguna, Calif. 92677
Filed Aug. 3, 1970, Ser. No. 24,263
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



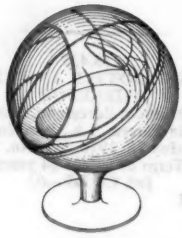
223,442
CANOPY FOR A GASOLINE DISPENSING STATION
Watrons A. Nielsen, Chicago, Ill., assignor to Card, Inc., Chicago, Ill.
Filed Jan. 14, 1970, Ser. No. 20,918
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



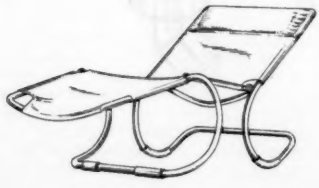
223,443
SHAMPOO CHAIR
Frederick Glaser, 1000 Lake Shore Plaza, Chicago, Ill. 60611
Filed Jan. 19, 1970, Ser. No. 20,964
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—3



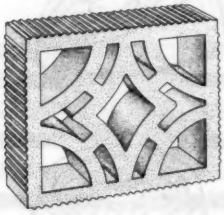
223,444
COMBINED CHAIR AND HAIR DRYER
Frederick Glaser, 1000 Lake Shore Plaza, Chicago, Ill. 60611
Filed Jan. 19, 1970, Ser. No. 20,994
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—3



223,445
CHAISE LONGUE
Thomas Larry Lamb, Toronto, Ontario, Canada, assignor to Thomas Lamb & Associates Limited, Toronto, Ontario, Canada
Filed Apr. 13, 1970, Ser. No. 22,403
Claims priority, application Canada Oct. 17, 1969
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—11



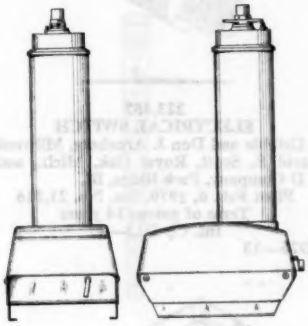
223,446
DECORATIVE BUILDING BLOCK
Pierre Charles Jean Gilson, 55A Grande Rue, Saint Sulpice, Vaud, Switzerland
Filed Sept. 30, 1970, Ser. No. 25,269
Claims priority, application France Aug. 19, 1970
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2



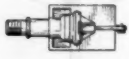
223,447
FISH LURE
Henry E. Stormer, 3255 S. Adams Road 48057, and Loren B. Palen, Jr., 2345 Hammerslea 48055, both of Pontiac, Mich.
Filed May 25, 1970, Ser. No. 23,144
Term of patent 3½ years
Int. Cl. D22—*05*
U.S. Cl. D22—27

223,448
FISHING SINKER LIFTER
Charles Anaclerio, 243 Hermosa Circle Road, Rancho Cabeza, and Carl R. Anaclerio, 1632 Hillview Terrace, both of Santa Rosa, Calif. 95405
Filed Oct. 20, 1970, Ser. No. 25,565
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30

223,449
FILTERING UNIT FOR A SWIMMING POOL
Norbert L. Reiner, Wallingford, Conn., Donald Huffman, Montreal, Canada, and Joseph Diemond, Simsbury, Conn., assignors to Coleco Industries, Inc., Hartford, Conn.
Filed Oct. 22, 1970, Ser. No. 25,603
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4

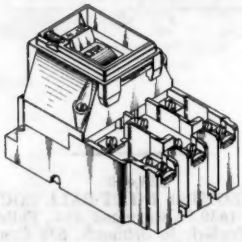


223,450
HORIZONTAL INLET BALL COCK
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Frederic E. Schmuck, 535 Century Drive, Anaheim, Calif. 92805
Filed July 2, 1970, Ser. No. 23,815
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



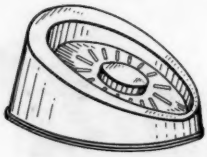
223,451
SPARK PLUG TESTER
Kenneth W. Huntwork, Rte. 5, Gladwin, Mich. 48624
Filed Apr. 27, 1970, Ser. No. 22,670
Term of patent 14 years
Int. Cl. D10—*10*
U.S. Cl. D26—1

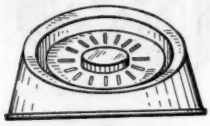
223,452
ELECTRICAL SWITCH
Joseph J. Gribble and Don J. Arneberg, Milwaukee, Wis., and David E. Scott, Royal Oak, Mich., assignors to Square D Company, Park Ridge, Ill.
Filed Feb. 6, 1970, Ser. No. 21,316
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



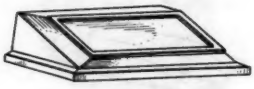
223,453
TELESCOPING ANTENNA ELEMENT
Edward Finkel, New York, N.Y., assignor to JFD Electronics Corporation, Brooklyn, N.Y.
Filed Oct. 28, 1970, Ser. No. 22,925
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

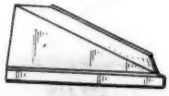
223,454
ANTENNA BASE
Edward Finkel, New York, N.Y., assignor to JFD Electronics Corporation, Brooklyn, N.Y.
Filed Oct. 28, 1970, Ser. No. 22,927
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14





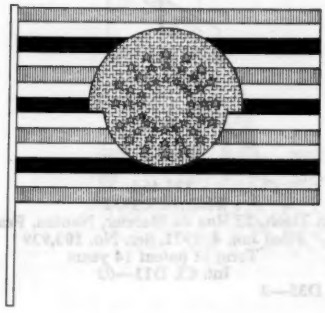
223,455
ANTENNA BASE
Edward Finkel, New York, N.Y., assignor to JFD Electronics Corporation, Brooklyn, N.Y.
Filed Oct. 28, 1970, Ser. No. 22,929
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



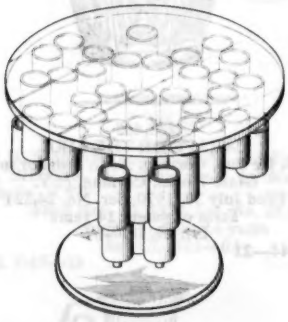


223,456
ANTENNA
Edward Finkel, New York, N.Y., assignor to JFD Electronics Corporation, Brooklyn, N.Y.
Filed Oct. 28, 1970, Ser. No. 22,930
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

223,457
FLAG
Bruce Romanoff, 32 Court St., Brooklyn, N.Y. 11201
Filed May 22, 1970, Ser. No. 23,099
Term of patent 14 years
Int. Cl. D11—*05*
U.S. Cl. D29—17



223,458
COFFEE TABLE
Irving H. Merritt, 211 Newman St., Metuchen, N.J. 08840
Filed Nov. 14, 1969, Ser. No. 19,807
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



223,459
GOLF CLUB GRIP
Clifford A. Spencer, Akron, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Mar. 18, 1970, Ser. No. 21,949
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

223,460
PLAYGROUND SLIDE APPARATUS
Claude W. Ahrens, West Highway 6, Grinnell, Iowa 50112
Filed Sept. 18, 1970, Ser. No. 25,056
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

223,461
GOLF CLUB GRIP OR SIMILAR ARTICLE
Clifford A. Spencer, Akron, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Nov. 23, 1970, Ser. No. 26,119
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5

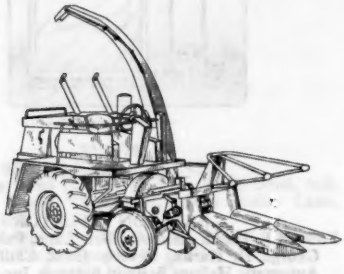
223,462
GOLF CLUB GRIP
Clifford A. Spencer, Akron, Ohio, assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Mar. 5, 1971, Ser. No. 121,615
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

223,463
COMPONENT FOR A MULTIPIECED BLOCK TOY OR THE LIKE
Robert Daenen, Erembodegem, Belgium, assignor to Dart Industries, Inc., Los Angeles, Calif.
Original design application Aug. 8, 1969, Ser. No. 18,587. Divided and this application Mar. 18, 1970, Ser. No. 22,226
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15

223,464
FLOWER POT
Leon Tisset, 22 Rue de Mercier, Nantua, France
Filed Jan. 4, 1971, Ser. No. 103,939
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—3

223,465
CARAFE OR THE LIKE
Ronald G. De Puy, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed July 30, 1970, Ser. No. 24,221
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—21

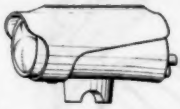
223,466
SELF-PROPELLED FORAGE HARVESTER
Ferol S. Fell, Newton, William D. Long, Hesston, and Bernard L. Wells and Richard E. Ten Eyck, Wichita, Kans., assignors to Hesston Corporation, Hesston, and Field Queen Incorporated, Maize, Kans., fractional part interest to each
Filed June 2, 1970, Ser. No. 23,585
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1



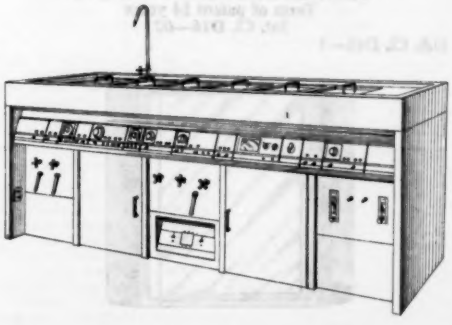
223,467
PIN
Daniel D. Molinoff, New Rochelle, and Jerrold H. Gottlieb, Scarsdale, N.Y., assignors to Idex, Inc., New Rochelle, N.Y.
Filed Nov. 12, 1970, Ser. No. 25,929
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19

223,468
COMBINED LAMP, METRONOME AND DESK SET
Robert D. Veech, 11 Yates Ave., Commack, N.Y. 11725
Filed May 1, 1970, Ser. No. 22,782
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20

223,469
COMBINED LAMP AND RADIO FOR BICYCLES
Lester Kenneth Franklin, 23 Repulse Bay Road, Apt. 10A, Hong Kong
Filed Oct. 28, 1970, Ser. No. 25,700
Term of patent 14 years
Int. Cl. D26—*06;* D17—*05*
U.S. Cl. D48—24

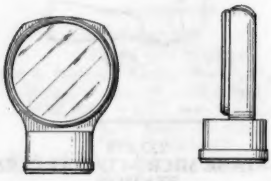


223,470
MULTI-STAGE MICRO-CIRCUIT CLEANING STATION
Howard M. Layton, Ossining, N.Y., assignor to Interlab, Inc., Pleasantville, N.Y.
Filed May 13, 1970, Ser. No. 22,949
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D49—11

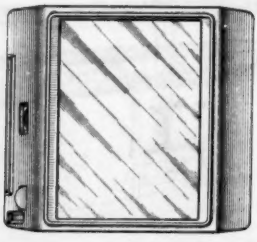


223,471
DISPOSABLE CUP DISPENSER
Ralph La Rue Dubois, 4242 E. 111th St., Tulsa, Okla. 74135
Filed Sept. 22, 1969, Ser. No. 19,251
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D52—2

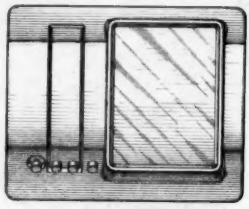
223,472
CASING FOR A DIAL INDICATOR
Zygmunt Natkanski, 6609 W. Melrose St., Chicago, Ill. 60634
Filed Sept. 4, 1970, Ser. No. 24,838
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D52—6



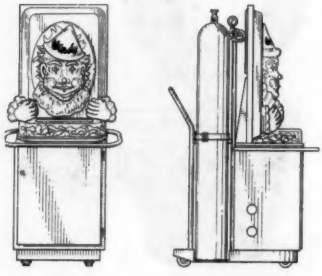
223,473
PORTABLE MICROFICHE VIEWER
Paul B. Specht, Evanston, and Alan N. Taylor, Skokie, Ill., assignors to Library Resources Inc., Chicago, Ill.
Filed Mar. 18, 1971, Ser. No. 125,915
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



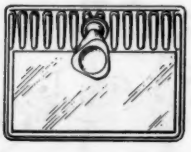
223,474
MICROFICHE VIEWER
Paul B. Specht, Evanston, Ill., assignor to Library Resources Inc., Chicago, Ill.
Filed Mar. 18, 1971, Ser. No. 125,916
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



223,475
BALLOON INFLATOR
Edward E. Elson, Anaheim, Bert Lane, Palm Springs, and George H. Karlin, Beverly Hills, Calif., assignors to Automatic Helium Balloon Systems, Inc., Beverly Hills, Calif.
Filed Oct. 23, 1970, Ser. No. 25,616
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1

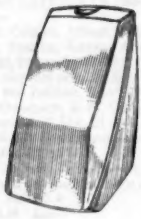


223,476
WRITING IMPLEMENT HOLDER
Roland Longarzo, Valley Stream, N.Y., assignor to Consolidated Foods Corporation, Chicago, Ill.
Filed Sept. 18, 1970, Ser. No. 25,319
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—5

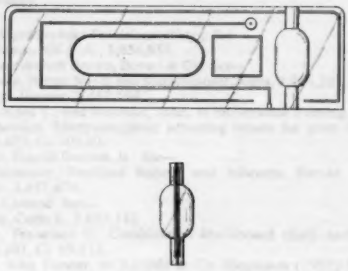


223,477
DISPLAY RACK
Michael Wahl, Flushing, N.Y., assignor to Wahl Associates, Inc., Long Island City, N.Y.
Filed June 17, 1970, Ser. No. 23,528
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D80—10

223,478
STEAM BATH CABINET
Dale L. Cosper, 1603 E. Hoover Ave., South Bend, Ind. 46615, and David W. Cosper, 15631 Robin Lane, Mishawaka, Ind. 46544
Filed Sept. 14, 1970, Ser. No. 24,992
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. 83—1



223,479
HEADER FOR A BODY-FLUID DRAINAGE BAG
Edgwin R. Polk, Fords, N.J., Sidney Polansky, Great Neck, N.Y., and Louis Mirando, Upper Saddle River, N.J., assignors to Packaging Associates, Inc.
Filed Jan. 13, 1970, Ser. No. 21,173
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D83—1



223,480
HAIR DRYER
Fredrick Glaser, 1000 Lake Shore Plaza, Chicago, Ill. 60611
Filed June 15, 1970, Ser. No. 23,481
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF APRIL, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

140/1500 Andalman, Avrum N.: *See—*
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50% Brazerol, William: *See—*
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680/1500 Cohen, Arnold L.: *See—*
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A B Bolinder-Munktell: *See—*
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Abell, William A., Jr., to International Business Machines Corporation. Pneumatic phrase/format writer utilizing card cartridge and featuring cyclical mechanism for reading a succession of cards as well as programming the tabulation and other functions of an interconnected printer. 3,656,601, Cl. 197-20.000

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Ackermann, Jacob; Croce, Roberto; and Reguzzoni, Riccardo, to Societa Italiana Resine S.p.A. Process for preparing acrylic or methacrylic acid. 3,657,331, Cl. 260-526.

Ackermann, Paul; and Heinrichs, Helmut, to Polycarbona Chemie GmbH. Process for the production of pure fumaric acid from aqueous solutions thereof. 3,657,333, Cl. 260-527.

Adachi, Kiyoshi: *See—*
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Adams, Lowell J., to Goodrich, B. F., Company, The. Electrical deicer for aircraft propeller. 3,657,514, Cl. 219-201.

Adams, William M. Relay control responsive to overvoltage and undervoltage. 3,657,603, Cl. 317-16.

Adesko, Paul L., to Du Pont de Nemours, E. I., and Company. Wire enamel of an aromatic polysulfone resin and a heat reactive condensate. 3,657,177, Cl. 260-30.4

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African Explosives and Chemical Industries Limited: *See—*
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Aizawa, Shojiro: *See—*
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Albo, Ronald T.; and Pastrone, John, to Information Printing Systems Corporation. Electromagnetic actuating means for print hammer. 3,656,425, Cl. 101-93.

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Jolly, Colin S., 3,657,182.

Alcocer, Francisco O. Combination blackboard chalk and eraser. 3,656,201, Cl. 15-118.

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Alexiev, Iwan Rangelov: *See—*
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Alf, Fritz; and Brill, Wolfgang, to Varta GmbH. Electric primary element and method of manufacturing the same. 3,657,019, Cl. 136-133.

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American Plant Growers, Inc.: *See—*
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AMP Incorporated: *See—*
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Anderson, Andrew W.; Alexander, James; Leszczynski, Martin E.; and Higgins, Lester A., to Scandia Packaging Machinery Company. Wrapping machine. 3,656,273, Cl. 53-59.

Anderson Bros. Mfg. Co.: *See—*
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Blackwell, John, to Du Pont de Nemours, E. I., and Company. Water insoluble blue anthraquinone dyes for cellulosic and synthetic fibers. 3,657,285, Cl. 260-381.

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Nelson, Axel B.; and Spacko, Roman F., to Sloan Valve Company. Adjustable quiet refill heads for flush valves. 3,656,499, Cl. 137-270.000

Nelson, David J. Tire pulverizer. 3,656,697, Cl. 241-222.

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Nichols, Matthew, to Sauter Packaging Company. Heat sealing station. 3,657,055, Cl. 156-583.

Nicholson, James F.; and Williams, Clarence, to Westinghouse Electric Corporation. Control system for electron beam magnetometer sensor. 3,657,643, Cl. 324-44.

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Nomura, Hirokazu, to Nippon Kokan Kabushiki Kaisha. Apparatus for simultaneously welding pairs of reinforcing plates to a base plate. 3,656,680, Cl. 228-44.

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Nordstrand, Leif Roland, to Monark-Crescent Aktiebolag. Washer systems for cleaning surfaces. 3,656,691, Cl. 239-284.

Nordstrom, Carl Gustaf. Transport of track-laying vehicles. 3,656,780, Cl. 280-415.

Noren, Carl Anders, to Atlas Copco Aktiebolag. Fluidic devices. 3,656,495, Cl. 137-81.5

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O'Brian, Ellen M. Automatic cut-off for intravenous equipment. 3,656,505, Cl. 137-399.

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O'Farrell, Francis J., to International Telephone and Telegraph Corporation. Code compression system. 3,657,718, Cl. 340-347.0dd

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Okaya, Takuji; Miyazaki, Hirotoshi; and Eguchi, Tamotsu. Process for the preparation of grafted solid materials of water-affinitive polymers. 3,656,884, Cl. 8-116.

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Oliver, Gene L.; and Brooker, Leslie G. S., to Eastman Kodak Company. Photographic silver halide emulsions containing K- substituted carbocyanine dyes. 3,656,957, Cl. 96-127.

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Westeren, Herbert W.; Gronquist, Ernest C., Jr.; Ott, Marvin J., Jr.; and Gunther, Donald E., to Hayes, C. I., Inc. Heat treating furnace with walking beam drive. 3,656,720, Cl. 263-6.
Western Electric Company, Incorporated: *See—*
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Yasu, Hideo, to Minolta Camera Kabushiki Kaisha. Automatic toner feeding device for electronic copying machines. 3,656,509, Cl. 137-560.

Yates, Paul C., to Du Pont de Nemours, E. I., and Company. Flame retardant antimony compositions. 3,657,179, Cl. 260-30.8

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Yoshida, Noble H., to National Cash Register Company, The. Encapsulation process. 3,657,144, Cl. 252-316.

Yoshida, Toyohiko; Wako, Shinichi; Koshimura, Masamitsu; Matsuzaka, Junichi; and Haruta, Yukinori, to Nippon Oils and Fats Company, Limited. Thermosetting coating compositions. 3,657,384, Cl. 260-856.

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Yoshino, Takachika; Saito, Shigeru; Sasaki, Yutaka; and Nakamura, Yoshimi, to Nitto Chemical Industry Co., Ltd. Production of attrition resistant sold catalysts containing antimony oxide suitable for use in a fluidized bed reaction. 3,657,155, Cl. 252-454.

Yu, Quin Shen, to United States Steel Corporation. Flexible starter bar. 3,656,538, Cl. 164-274.

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Zagar, Irvin F., to Wilfley, A. R., and Sons, Inc. Centrifugal pump with mating case plate volute halves and constant section impeller

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Zahradnik, George J., to Dick, A. B., Company. Film cartridge guide assembly. 3,656,675, Cl. 226-89.

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Zickefoose, Ellis J., to Amsted Industries Incorporated. Apparatus for casting molten metal. 3,656,539, Cl. 164-309.

Zimmerman, Carl A., to Standard Brands Chemical Industries, Inc. Carboxylic acid latices providing unique thickening and dispersing agents. 3,657,175, Cl. 260-29.6

Zimmerman, Carl W., to Halliburton Company. Compensated nuclear densometer and method. 3,657,532, Cl. 250-43.5

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Zmyslowski, Wojciech; Decowska, Zofia; Gawronski, Ryszard; Borejko, Zdzislawa; Decowski, Marek; and Wirski, Janusz, to Polska akadamia Nauk. Method and apparatus of automatic estimation of nonregular curves, especially electromiographic curves and the digital system for realization of the method. 3,657,646, Cl. 324-77.

Zuurveen, Frans, to U.S. Philips Corporation. Shaving-head assembly. 3,656,235, Cl. 30-346.51

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LIST OF PLANT PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF APRIL, 1972

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Arthur Bright: *See*—
Anderson, Frederic W. 2,125.

Baron, Milton, to J. Frank Schmidt and Son, Co. Mountain ash tree. 3,114, 4–18–72, Cl. 51.

Boerner, Eugene S., deceased, by Lincoln Rochester Trust Co., and R. L. Boerner, executors, to Jackson & Perkins Co. Rose plant. 3,118, 4–18–72, Cl. 22.

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Curtis, Eldon C., to E. V. Kimbrew. Rose plant. 3,115, 4–18–72, Cl. 18.

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Ecke, Paul, to Paul Ecke, Inc. Poinsettia plant. 3,119, 4–18–72, Cl. 86.

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Garabedian, John M. Grapevine. 3,124, 4–18–72, Cl. 47.

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Holm, Josef, to Mikkelsens Inc. Poinsettia plant. 3,122, 4–18–72, Cl. 86.

Jackson & Perkins Co.: *See*—
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Johnson, Harold A., Jr., and H. E. Thomas, to Driscoll Strawberry Associates, Inc. Strawberry plant. 3,123, 4–18–72, Cl. 49.

Kendall, Harold E. Avocado tree. 3,116, 4–18–72, Cl. 44.

Kendall, Harold E. Avocado tree. 3,117, 4–18–72, Cl. 44.

Kimbrew, E. V.: *See*—
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Staggs, Wilton L. and S. E. 3,127.

Staggs, Wilton L. and S. E. Peach tree. 3,127, 4–18–72, Cl. 43.

Stark Bro's. Nurseries & Orchards Co.: *See*—
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Taylor, Alvah, to Stark Bro's. Nurseries & Orchards Co. Apple tree. 3,121, 4–18–72, Cl. 34.

Thomas, Harold E.: *See*—
Johnson, Harold A., Jr., and Thomas. 3,123.

Verbeek, Gijsbert. Rose plant. 3,112, 4–18–72, Cl. 18.

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Ahrens, Claude W. Playground slide apparatus. 223,460, 4–18–72, Cl. D34—5.

Ajax Hardware Mfg. Corp.: *See*—
Miller, George F., and Tintary. 223,433.

Anacierio, Carl R.: *See*—
Anacierio, Charles and C. R. 223,448.

Anacierio, Charles and C. R. Fishing sinker lifter. 223,448, 4–18–72, Cl. D22—30.

Arneberg, Don J.: *See*—
Gribbie, Joseph J., Arneberg, and Scott. 223,452.

Automatic Helium Balloon Systems, Inc.: *See*—
Elson, Edward E., Lane, and Karlin. 223,475.

Brosk, Doris. Dress or like garment. 223,430, 4–18–72, Cl. D2—81.

Card, Inc.: *See*—
Nielsen, Watrons A. 223,442.

Coleco Industries, Inc.: *See*—
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199 3,657,067
205 3,657,069
358 3,657,068

CLASS 164
52 3,656,535
89 3,656,536
251 3,656,537
274 3,656,538
309 3,656,539

CLASS 165
1 3,656,540
16 3,656,541
66 3,656,542
74 3,656,543
3,656,544
3,656,545
81 3,656,546
106 3,656,547
159 3,656,548

CLASS 166
.5 3,656,549
270 3,656,550
279 3,656,551
315 3,656,552

CLASS 169
1A 3,656,553

CLASS 172
14 3,656,554
16 3,656,555
212 3,656,556
277 3,656,557
803 3,656,558
805 3,656,559

CLASS 173
12 3,656,560
163 3,656,561

CLASS 174
15C 3,657,466
3,657,467
25 3,657,468
73SC 3,657,469

CLASS 175
4.51 3,656,562
22 3,656,563
228 3,656,564
323 3,656,565

CLASS 176
59 3,656,566

CLASS 177
155 3,656,567
200 3,656,568
210 3,656,569

CLASS 178
3 3,657,470
5.4CD 3,657,471
6.7A 3,657,473
6.7R 3,657,472
7.86 3,657,474
18 3,657,475
22 3,657,476
3,657,477
63 3,657,478

CLASS 179
1C 3,657,479
1D 3,657,480
6.3R 3,657,481
7MM 3,657,482
15AT 3,657,483
16AA 3,657,484
18EB 3,657,485
18J 3,657,486
100R 3,657,487
100.1R 3,657,488
100.2S 3,657,489
121D 3,657,490

CLASS 180
6.48 3,656,570
11 3,656,571
21 3,656,572
44R 3,656,573
114 3,656,574
120 3,656,575

CLASS 181
.5A 3,656,585
33G 3,656,576
3,656,577

CLASS 182
20 3,656,578
48 3,656,579
82 3,656,580
224 3,656,581

CLASS 184
6.11 3,656,583
6.5 3,656,582
7R 3,656,584

CLASS 185
37 3,656,586

CLASS 186
1A 3,656,587

CLASS 188
62 3,656,588
72.5 3,656,589
73.4 3,656,590
82.84 3,656,591
270 3,656,592
300 3,656,593

CLASS 190
57 3,656,594

CLASS 191
12.2 3,657,491

CLASS 192
.055 3,656,600
13R 3,656,595
17R 3,656,596
35 3,656,597
3,656,598
42 3,656,599

CLASS 195
30 3,657,070
66R 3,657,071
81 3,657,072
127 3,657,073

CLASS 197
20 3,656,601
133P 3,656,602

CLASS 198
20 3,656,603
33AA 3,656,604
3,656,605
34 3,656,606
118 3,656,607
138 3,656,608
224 3,656,609
230 3,656,610

CLASS 200
5R 3,657,492
6B 3,657,493
11DA 3,657,494
16B 3,657,495
42 3,657,722
43 3,657,496
50A 3,657,497
61.04 3,657,498
61.45R 3,657,499
3,657,500
81.4 3,657,501
144B 3,657,502
155R 3,657,503
163 3,657,504
166A 3,657,723
166C 3,657,505

CLASS 203
52 3,657,074

CLASS 204
15 3,657,075
16 3,657,076
35N 3,657,077
35R 3,657,078
51 3,657,079
3,657,080
105R 3,657,081
130 3,657,082
140.5 3,657,083
147 3,657,084
157.1R 3,657,085
158R 3,657,086
3,657,087
159.15 3,657,088
164 3,657,089
3,657,090
181 3,657,091
3,657,092
195 3,657,093
3,657,094
3,657,095
3,657,096
202 3,657,097
219 3,657,098
253 3,657,099
284 3,657,100
3,657,101
290F 3,657,102
299 3,657,103
3,657,260
301 3,657,104
3,657,105
3,657,106
323 3,657,107

CLASS 206
44R 3,656,611
45.14 3,656,612
45.21 3,656,613
65S 3,656,614

CLASS 208
10 3,657,108
80 3,657,109
89 3,657,110
108 3,657,111
211 3,657,112

CLASS 209
73 3,656,615
74 3,656,616
122 3,656,617
139A 3,656,618

CLASS 210
23 3,657,113
3,657,115
31C 3,657,116
31 3,657,117
3,657,118
36 3,657,119
40 3,657,125
83 3,656,619
110 3,656,620
133 3,656,621
231 3,656,622
242 3,656,623
3,656,624
266 3,656,625
282 3,656,626
315 3,656,627

CLASS 211
13 3,656,628
40 3,656,629
119.11 3,656,630

CLASS 212
57 3,656,631

CLASS 213
43 3,656,632
3,656,633

CLASS 214
6A 3,656,634
8.5C 3,656,635
8.5F 3,656,636
75H 3,656,637
83.14 3,656,638
84 3,656,639
138R 3,656,640
140 3,656,642
152 3,656,641
315 3,656,643
390 3,656,644

CLASS 215
9 3,656,645
3,656,646
3,656,647
46R 3,656,648

CLASS 217
52 3,656,649

CLASS 219
10.75 3,657,506
69G 3,657,507
85 3,657,508
120 3,657,509
121LA 3,657,510
125 3,657,511
131R 3,657,512
3,657,724
200 3,657,513
201 3,657,514
211 3,657,515
345 3,657,516
535 3,657,517
536 3,657,518
3,657,519
553 3,657,520

CLASS 220
22.3 3,656,650
3,656,651
54 3,656,652
3,656,653
90.2 3,656,654

CLASS 221
82 3,656,655
173 3,656,656

CLASS 222
4 3,656,657
5 3,656,658
49 3,656,659
94 3,656,660
194 3,656,661
386.5 3,656,662
460 3,656,663
500 3,656,665
518 3,656,664
556 3,656,666
561 3,656,667
570 3,656,668

CLASS 223
40 3,656,669

CLASS 224
42.45R 3,656,670

CLASS 225
1 3,656,671
3 3,656,672

CLASS 226
2 3,656,673
25 3,656,674
89 3,656,675
92 3,656,676
180 3,656,677

CLASS 227
128 3,656,678
144 3,656,679

CLASS 228
44 3,656,680

CLASS 229
15 3,656,681
31 3,656,683
37R 3,656,682
92.8 3,656,684

CLASS 233
19 3,656,685

CLASS 234
1 3,656,686
2 3,656,687

CLASS 235
61.12N 3,657,522
61.7B 3,657,521
86 3,656,688
92PC 3,657,725
94R 3,657,523
150.1 3,657,524
150.2 3,657,726
151.11 3,657,525
151.33 3,657,526
153 3,657,527
159 3,657,529
193 3,657,528

CLASS 237
8 3,656,689

CLASS 238
2 3,656,690

CLASS 239
284 3,656,691
405 3,656,692
410 3,656,693
533 3,656,694

CLASS 240
104 3,657,530

CLASS 241
103 3,656,695
155 3,656,696
222 3,656,697

CLASS 242
27 3,656,698
55.3 3,656,699
67.1 3,656,700
83 3,656,701
192 3,656,702
3,656,703
198 3,656,704
199 3,656,705

CLASS 244
2 3,656,723

CLASS 248
22 3,656,725
124 3,656,726
201 3,656,727
399 3,656,728

CLASS 249
18 3,656,729
134 3,656,730
135 3,656,731
179 3,656,732

CLASS 250
41.9ME 3,657,531
43.5D 3,657,532
49.5TE 3,657,533
59 3,657,534
71R 3,657,537
71.5R 3,657,535
83 3,657,538
83.1 3,657,539
83.3R 3,657,540
3,657,541
84 3,657,542
84.5 3,657,536
199 3,657,543
3,657,544
201 3,657,545
202 3,657,546
203R 3,657,547
3,657,548
209 3,657,549
217CR 3,657,550
219WE 3,657,727
231R 3,657,551

CLASS 251
38 3,656,706
62 3,656,707
63.6 3,656,708
95 3,656,709
144 3,656,710
151 3,656,711
306 3,656,712
309 3,656,713
360 3,656,714

CLASS 252
8 3,657,120
8.3 3,657,121
8.5C 3,657,122
3,657,134
34.7 3,657,123
42.7 3,657,124
49.5 3,657,126
49.6 3,657,127
49.9 3,657,128
51.5R 3,657,129
62.1 3,657,130
62.57 3,657,131
63 3,657,132
76 3,657,133
88 3,657,135
301.1 3,657,137
301.2W 3,657,139
301.4R 3,657,138
3,657,140
3,657,141
301.6S 3,657,142
316 3,657,143
3,657,144
321 3,657,136
345 3,657,145
369 3,657,146
408 3,657,147
429R 3,657,148
431R 3,657,149
435 3,657,150
437 3,657,151
443 3,657,152
455R 3,657,153
455Z 3,657,154
456 3,657,155
466J 3,657,156
466 3,657,157

CLASS 254
168 3,656,715

CLASS 259
4 3,656,716
3,656,717
84 3,656,718

CLASS 260
2EP 3,657,159
2A 3,657,158
2.3 3,657,160
2.5AW 3,657,161
2.5HA 3,657,166
2.5B 3,657,162
3,657,164
2.5E 3,657,163
3,657,165
5 3,657,203
9 3,657,167
14 3,657,168

18R 3,657,169
23H 3,657,114
23.7M 3,657,170
27EV 3,657,171
29.6RB 3,657,172
29.6F 3,657,173
29.6M 3,657,176
29.6T 3,657,175
29.6 3,657,174
30.4R 3,657,177
30.6R 3,657,178
30.8DS 3,657,179
31.8XA 3,657,180
33.4R 3,657,182
33.6F 3,657,181
45.8NZ 3,657,183
45.85 3,657,184
47CB 3,657,186
47C 3,657,185
60 3,657,188
65 3,657,190
67FP 3,657,189
75T 3,657,191
76 3,657,193
77.5AM 3,657,192
77.5B 3,657,198
78SC 3,657,195
78L 3,657,194
78.4EP 3,657,196
78.5T 3,657,197
3,657,199
79.3MU 3,657,201
79.3A 3,657,200
3,657,202
80L 3,657,378
80.3R 3,657,262
80.78 3,657,204
82.1 3,657,205
85.1 3,657,206
88.2R 3,657,208
88.3L 3,657,207
94.3 3,657,209
94.9P 3,657,210
94.9R 3,657,211
3,657,212
156 3,657,213
3,657,214
158 3,657,187
3,657,215
163 3,657,216
165 3,657,217
175 3,657,218
176 3,657,219
207 3,657,220
239BC 3,657,222
3,657,229
239 3,657,230
239.1 3,657,224
239.3D 3,657,223
239.5 3,657,225
239.55R 3,657,226
239.55 3,657,227
239.57 3,657,228
240B 3,657,231
243C 3,657,232
247.1 3,657,237
3,657,238
247.5R 3,657,233
248AS 3,657,234
248NS 3,657,235
249.7A 3,657,236
250A 3,657,239
3,657,241
3,657,242
3,657,243
251A 3,657,240
256 3,657,244
256.4F 3,657,246
256.5R 3,657,245
3,657,247
279R 3,657,248
3,657,249
286Q 3,657,250
290R 3,657,251
292 3,657,252
3,657,253
3,657,257
293.55 3,657,254
293.62 3,657,258
295R 3,657,259
295.5R 3,657,255
296D 3,657,256
302S 3,657,261
304 3,657,263
306.8D 3,657,264
307C 3,657,265
308A 3,657,266
309.2 3,657,267
309.6 3,657,268
3,657,269
309.7 3,657,221
310C 3,657,270
310R 3,657,271
314.5 3,657,272
326.3 3,657,273
3,657,274
327B 3,657,275
3,657,276
340.9 3,657,277
345.1 3,657,278
345.5 3,657,279
346.2 3,657,281
346.4 3,657,280
348A 3,657,282
363 3,657,283
378 3,657,284
381 3,657,285
396K 3,657,286
3,657,287
397.3 3,657,288
3,657,289
397.45 3,657,290
408 3,657,291
410 3,657,292
413 3,657,293
429R 3,657,295
429.7 3,657,294
430 3,657,296
439CY 3,657,297
440 3,657,298
448A 3,657,299
3,657,300
3,657,301
448.2B 3,657,305
448.2E 3,657,302
448.2N 3,657,303
3,657,304
453AL 3,657,306
453PC 3,657,308
453R 3,657,307
455C 3,657,309
463 3,657,310
3,657,311
3,657,312
464 3,657,313
465D 3,657,314
465.8 3,657,315
468B 3,657,317
468R 3,657,316
470 3,657,318
471C 3,657,319
3,657,320
473S 3,657,321
3,657,322
475SC 3,657,323
482B 3,657,324
483 3,657,325
491 3,657,326
501.17 3,657,327
514R 3,657,328
514.5 3,657,329
525 3,657,330
526N 3,657,331
3,657,332
527R 3,657,333
531R 3,657,334
533C 3,657,335
539R 3,657,336
551C 3,657,337
553R 3,657,338
555S 3,657,339
557R 3,657,340
558A 3,657,341
558R 3,657,342
3,657,343
562N 3,657,344
563R 3,657,345
564R 3,657,346
583P 3,657,347
586R 3,657,348
3,657,349
590 3,657,350
593R 3,657,351
604R 3,657,354
606.5P 3,657,352
607A 3,657,353
609E 3,657,355
611.5 3,657,356
613D 3,657,358
3,657,359
613R 3,657,357
615R 3,657,360
3,657,361
3,657,362
642 3,657,363
644 3,657,364
652R 3,657,365
652.5R 3,657,366
659A 3,657,367
666A 3,657,368
669P 3,657,369
671B 3,657,371
671R 3,657,370
674A 3,657,372
677A 3,657,374
677 3,657,373
679A 3,657,375
681 3,657,376
683.48 3,657,377
824R 3,657,379
831 3,657,380
836 3,657,381
3,657,382
838 3,657,383
856 3,657,384
857PG 3,657,386
857R 3,657,385
866 3,657,387
873 3,657,388
3,657,389
876R 3,657,390
3,657,391
878R 3,657,392
3,657,395
887 3,657,393
897C 3,657,394
901 3,657,396
921 3,657,397
973 3,657,398

CLASS 261

72R 3,656,736

CLASS 263

6A 3,656,720
6R 3,656,719
19R 3,656,721
21A 3,656,722

CLASS 264

30 3,657,399
40 3,657,400
41 3,657,401
45 3,657,402
51 3,657,403
81 3,657,404
89 3,657,405
98 3,657,406
156 3,657,407
182 3,657,408
3,657,409
194 3,657,410
290R 3,657,411

CLASS 266

6S 3,656,733
23N 3,656,734
33S 3,656,735

CLASS 267

73 3,656,737

CLASS 270

58 3,656,738
3,656,739
3,656,740
66 3,656,741

CLASS 271

3 3,656,742
60 3,656,744
61 3,656,743

CLASS 272

79A 3,656,745

CLASS 273

1R 3,656,746
95A 3,656,747
102.1F 3,656,748
105R 3,656,749
3,656,750
122R 3,656,753
124A 3,656,754
131AC 3,656,755
131R 3,656,756
134B 3,656,751
134D 3,656,757
4G 3,656,758
183E 3,656,752
185D 3,656,759

CLASS 274

1R 3,656,760
4G 3,656,761
37 3,656,762

CLASS 277

63 3,656,763
81 3,656,765
92 3,656,764
136 3,656,766
140 3,656,767
167 3,656,768
189.5 3,656,770
207A 3,656,771
207 3,656,769

CLASS 279

23 3,656,772
121 3,656,773

CLASS 280

11.35T 3,656,774
16 3,656,775
81A 3,656,776
87.04B 3,656,777
150B 3,656,779
150.5 3,656,778
415R 3,656,780

CLASS 285

3 3,656,781
187 3,656,784
189 3,656,782
239 3,656,783

CLASS 287

52.06 3,656,785
189.35 3,656,786

CLASS 290

40B 3,657,552

CLASS 292

79 3,656,787
148 3,656,788
304 3,656,789

CLASS 293

1 3,656,790
3,656,791
85 3,656,792

CLASS 294

19R 3,656,793
64R 3,656,794
67R 3,656,795
78R 3,656,796
82R 3,656,797

CLASS 296

23MC 3,656,798
23R 3,656,724
35R 3,656,799
50 3,656,800
57R 3,656,801
100 3,656,802
102 3,656,803

CLASS 297

170 3,656,804
302 3,656,805
324 3,656,806
445 3,656,808
452 3,656,807
461 3,656,809

CLASS 299

33 3,656,810

CLASS 302

23 3,656,811
53 3,656,812

CLASS 303

2 3,656,813
19 3,656,814
21CG 3,656,815
21P 3,656,816
3,656,817

CLASS 307

10 3,657,553
20 3,657,728
88.3 3,657,554
108 3,657,555
118 3,657,556
225 3,657,557
228 3,657,558
230 3,657,559
233 3,657,560
3,657,561
243 3,657,562
251 3,657,563
252B 3,657,565
252K 3,657,564
259 3,657,567
260 3,657,566
268 3,657,568
275 3,657,569
279 3,657,570
293 3,657,571
297 3,657,572
302 3,657,574
304 3,657,573
3,657,575
309 3,657,576
315 3,657,577

CLASS 308

3 3,656,818
9 3,656,819
36.1 3,656,820
72 3,656,821
122 3,656,822
160 3,656,823
187.1 3,656,824
213 3,656,825

CLASS 310

8 3,657,578
8.1 3,657,579
8.2 3,657,581
52 3,657,580
156 3,657,582
162 3,657,583
232 3,657,584

CLASS 313

68 3,657,596
92LF 3,657,586
92R 3,657,585
109.5 3,657,587
113 3,657,588
178 3,657,589
223 3,657,590
3,657,591
357 3,657,592

CLASS 315

8 3,657,729
18 3,657,593
30 3,657,595
36 3,657,594
86 3,657,597
100T 3,657,598

CLASS 316

19 3,656,826

CLASS 317

3 3,657,599
4 3,657,600
5 3,657,601
11C 3,657,607
12R 3,657,602
16 3,657,603
18D 3,657,604
36TD 3,657,605
112 3,657,606
118 3,657,608
234R 3,657,611
234 3,657,609
3,657,610
235R 3,657,612
3,657,613
3,657,614
3,657,615
3,657,616
236 3,657,617

CLASS 318

102 3,657,618
221E 3,657,620
3,657,621
221R 3,657,619
237 3,657,622
326 3,657,623
341 3,657,624
370 3,657,625
443 3,657,626
601 3,657,627
606 3,657,628
647 3,657,629
676 3,657,630

CLASS 321

2 3,657,631
8R 3,657,632
9A 3,657,633
45S 3,657,634
69R 3,657,635

CLASS 324

.5 3,657,730
6 3,657,636
8 3,657,637
29.5 3,657,639
30R 3,657,640
3,657,731
37 3,657,638
43R 3,657,641
44 3,657,642
3,657,643
61R 3,657,644
65R 3,657,645
77A 3,657,646
94 3,657,647
115 3,657,649
122 3,657,648
126 3,657,650
137 3,657,651

CLASS 325

15 3,657,652
38B 3,657,653
64 3,657,655
130 3,657,656
452 3,657,654

CLASS 328

14 3,657,657
61 3,657,658
133 3,657,659
148 3,657,660
155 3,657,732

CLASS 329

122 3,657,661

CLASS 330

4.3 3,657,733
15 3,657,734
17 3,657,662
85 3,656,831
165 3,657,663

CLASS 331

1A 3,657,664
17 3,657,665
94.5 3,657,735
107G 3,657,666
116M 3,657,667

CLASS 333

11 3,657,668
18 3,657,669
73W 3,657,670
82B 3,657,671

CLASS 335

21 3,657,672
199 3,657,673
210 3,657,674
3,657,675
217 3,657,676

CLASS 336

96 3,657,677
160 3,657,678

CLASS 337

244 3,657,679
308 3,657,680

CLASS 338

32H 3,657,686
32R 3,657,685
32 3,657,687
150 3,657,688
3,657,689
154 3,657,690
182 3,657,691
252 3,657,692

CLASS 339

61M 3,657,681
103M 3,657,682
246 3,657,683
266R 3,657,684

CLASS 340

6R 3,657,693
15.5BH 3,657,694
52H 3,657,695
54 3,657,696
64 3,657,697
146.1 3,657,698
3,657,699
3,657,700
147R 3,657,701
149R 3,657,702
167R 3,657,703
172.5 3,657,704
3,657,705
3,657,706
3,657,736
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190	3,656,864	415	3,656,874	118	3,657,418	228	3,657,428	263	3,657,439	277	3,657,448
221	3,656,865		CLASS 418	119	3,657,419	229	3,657,429	267	3,657,440	279	3,657,453
	CLASS 417	54	3,656,875	121	3,657,420	230	3,657,430	273	3,657,441	283	3,657,450
38	3,656,866	185	3,656,876	122	3,657,421		3,657,431		3,657,442	288	3,657,451
50	3,656,867		CLASS 424		3,657,422	232	3,657,432		3,657,443	300	3,657,452
53	3,656,868			127	3,657,423	235	3,657,433		3,657,445	301	3,657,454
220	3,656,869	81	3,657,413	153	3,657,424	241	3,657,434	274	3,657,444		CLASS 425
300	3,656,870	84	3,657,414	167	3,657,412		3,657,435		3,657,446	150	3,656,877
361	3,656,871	88	3,657,415	178	3,657,425	244	3,657,436		3,657,447		CLASS 431
364	3,656,872	94	3,657,416	200	3,657,426	248	3,657,437	276	3,657,449	10	3,656,878
395	3,656,873	95	3,657,417	216	3,657,427		3,657,438			349	3,656,879

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DESIGN PATENTS

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17 : 223,442
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36 : 223,430
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39 : 223,459
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40 : 223,471
41 : 223,434
43 : 223,464
55 : 223,452

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6 : 3,119
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3,123
3,124
3,125
12 : 3,116
18 : 3,117
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26 : 3,114
36 : 3,118
45 : 3,127
48 : 3,113
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53 : 3,121

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